DECEMBER, 1955

Commercial Fertilizer

and PLANT FOOD INDUSTRY

SOUTH, NORTH OR WEST...

There's a Nitrogen Division plant ready to serve you . . . handy for shipping by rail or by highway. Three big and growing plants at Hopewell, Virginia, at Ironton, Ohio, and at Omaha, Nebraska, are strategically located to serve the fertilizer industry. We have the quality, the volume and the shipping capacity to supply your needs for Nitrogen Solutions and solids.

Call on us also for technical help based on 25 years of Nitrogen Solutions research and development. Improved new NITRANA®, URANA® and U-A-S* Nitrogen Solutions can help you turn out better-conditioned, top-quality mixed goods, often at lower cost. Ask for the help of one of our technical service representatives available to our customers without charge.

Arcadian

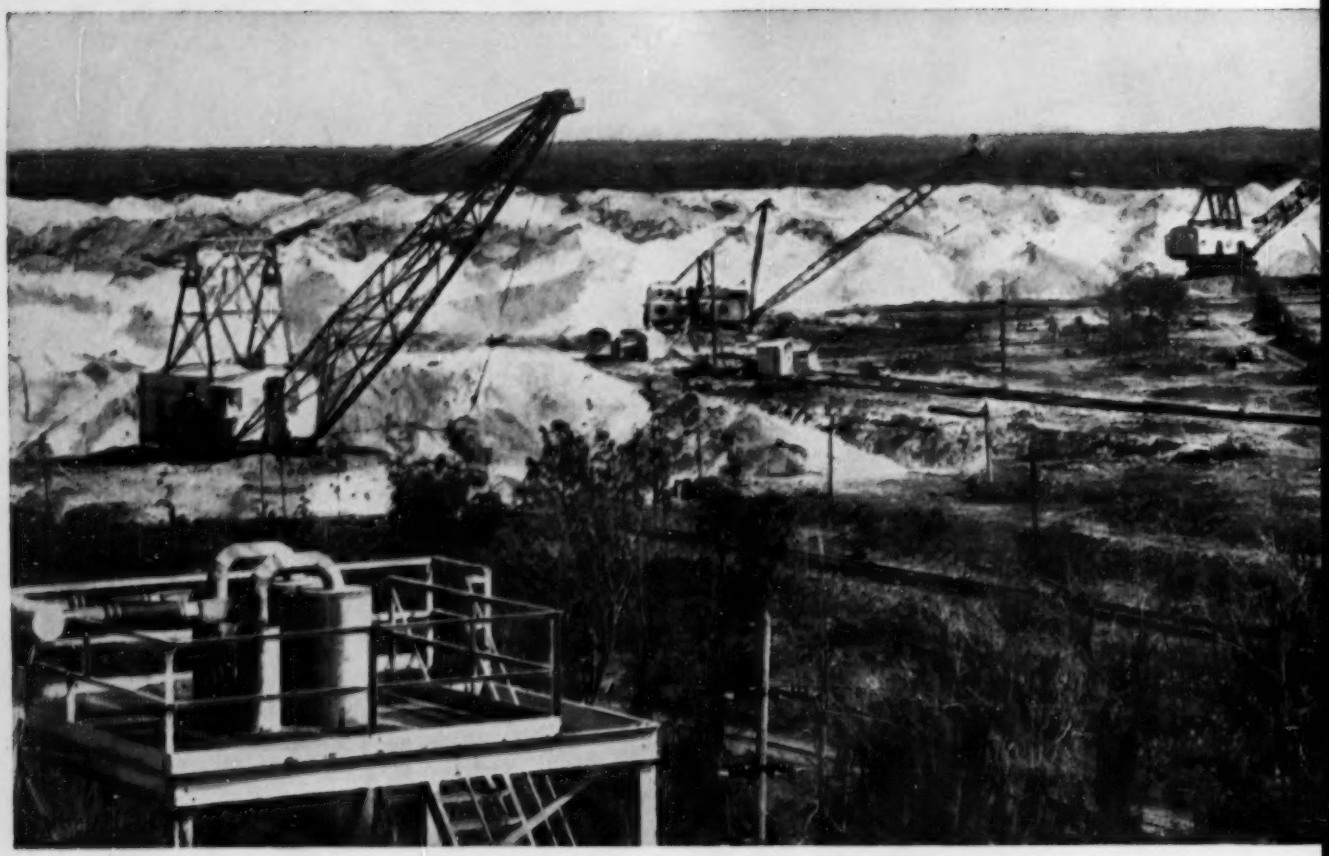
PRODUCTS FOR PROFITABLE FARMING

Nitrogen Solutions (Nitrana® and Urana®)
American Nitrate of Soda
A-N-L®
Nitrogen Fertilizer
Urea Fertilizer
Sulphate of Ammonia

*Trade-mark

NITROGEN DIVISION Allied Chemical & Dye Corporation
New York 6, N. Y. • Hopewell, Va. • Ironton, Ohio • Omaha 7, Neb.
Indianapolis 20, Ind. • Kalamazoo, Mich. • Columbia, Mo. • Atlanta 3, Ga.
Columbia 1, S. C. • San Francisco 3, Calif. • Los Angeles 5, Calif.

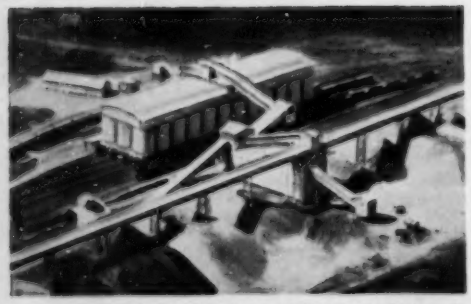
NITROGEN DIVISION ALLIED CHEMICAL



Three of the A.A.C. Co's electrically-operated draglines at work at our phosphate mines in Central Florida. Bucket capacities range from 9½ to 17 cubic yards. The 17-yard draglines with their 175-foot booms each weigh more than a million and a half pounds and can move 35,000 tons of material in 24 hours. From these rock deposits flow a continuous stream of high quality phosphate rock, assuring a dependable source of supply of AA QUALITY phosphorus products, see list below.

AA Quality...

for over 85 years a symbol of quality and reliability



From the air—wet rock storage and drying plant, with dry rock storage silos in background. These silos, 29 in number, have a total capacity of 40,000 tons of dried rock. Under the silos are four runways where 40 railroad cars can be loaded at a time.

principal AA QUALITY products

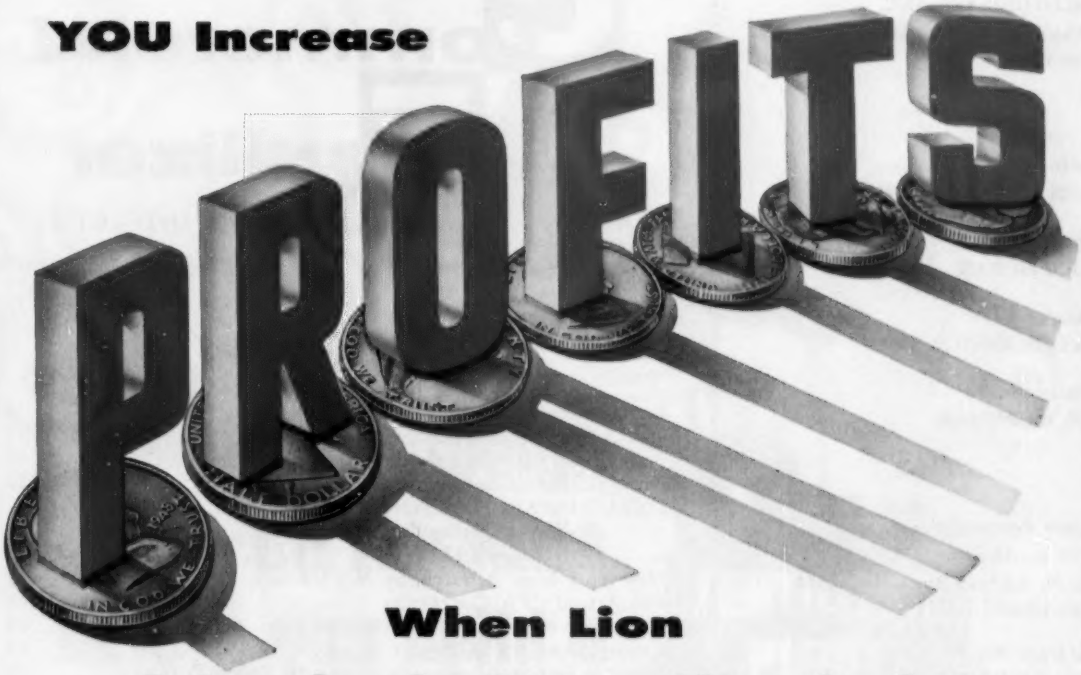
All grades of Florida Pebble Phosphate Rock
AA QUALITY Ground Phosphate Rock
All grades of Complete Fertilizers **Superphosphate**
Gelatin **Bone Products** **Salt Cake** **Ammonium Carbonate**
Sulphuric Acid **Fluosilicates** **Insecticides and Fungicides**
Phosphoric Acid and Phosphates
Phosphorus and Compounds of Phosphorus

THE AMERICAN AGRICULTURAL CHEMICAL COMPANY

GENERAL OFFICE: 50 CHURCH STREET, NEW YORK 7, N. Y.

30 FACTORIES AND SALES OFFICES, SERVING U.S., CANADA AND CUBA—ASSURE DEPENDABLE SERVICE

YOU Increase



When Lion

- A Leader in Petro-Chemicals -

Supplies Your NITROGEN NEEDS

HERE'S THE LION LINE-UP OF QUALITY NITROGEN FERTILIZER MATERIALS

Lion Anhydrous Ammonia—82.2% nitrogen. Quality guaranteed.

Lion Aqua Ammonia—Ammonia content about 30%—other grades to suit your requirements.

Lion Ammonium Nitrate Fertilizer—Improved spherical pellets. Guaranteed 33.5% nitrogen.

Lion Nitrogen Fertilizer Solutions—Various types to suit your particular manufacturing needs.

Lion Sulphate of Ammonia—White, uniform, free flowing crystals. Guaranteed 21% nitrogen.

Now that the new fertilizer manufacturing season is in full swing, make sure you realize all the profits your plant can produce. *Where you buy* your raw materials can be vital and now, more than ever before, it pays to buy *your nitrogen needs* from Lion—a leader!

Lion nitrogen products are manufactured under rigid controls to meet exacting specifications—ending the costly production delays that result when ingredients vary in quality from day to day. With Lion products, you produce with maximum efficiency and profit—and you maintain the quality standards your customers demand.

Lion also provides an expert technical staff to assist you in solving difficult formulation and processing problems. And, throughout the year, Lion's sales building advertising tells farmers the plant food story—for your benefit. Lion's leadership in customer service stands out, offering you outstanding opportunities for increased profits—and your best season yet!

DISTRICT SALES OFFICES: NATIONAL BANK OF COMMERCE BUILDING, New Orleans, La. • SHEPHERD BUILDING, Montgomery, Ala.

LION OIL COMPANY

CHEMICAL SALES DIVISION — **EL DORADO, ARKANSAS**

LION

Published by
WALTER W. BROWN
PUBLISHING CO., INC.
75 Third St., N. W., Atlanta 8, Georgia
Phone Atwood 4160

President
ERNEST H. ABERNETHY

Editor
BRUCE MORAN

Managing Editor
CLAY W. PENICK, JR.

Business Manager
V. T. CRENSHAW

Chicago Representative
ELON A. ABERNETHY
1200 N. Ashland Ave.—Room 544
Phone CApitol 7-4111

West Coast Representative
M. A. CALDWELL
2267 W. 24th St., Los Angeles, Cal.
Phone REPUBLIC 1-3050

Address all correspondence to Atlanta Publishing Offices, sending direct to COMMERCIAL FERTILIZER and PLANT FOOD INDUSTRY, 75 Third St., N. W., Atlanta 8, Georgia.
Published Monthly by

Vol. 91 No. 6 *Established 1910* December, 1955

Commercial Fertilizer
and PLANT FOOD INDUSTRY

Subscription rates: United States, $3.00 per year; 5 years, $12.00. Foreign $5.00 per year.

Contents

Commenting Freely, by *Bruce Moran* 4
Just Around the Corner, by *Vernon Mount* 6
National Grange "Emergency" Program 19
Fewer Grades Needed, says *Frank E. Boyd* 22
USDA RESEARCH REPORTS
The Food Quality Frontier 24
Search for Problem Soils 26
New York State Research, by *N. C. Brady* 33
600 Attend CFA Convention 34
A Program of Service, by *Russell Coleman* 34
Research Results and Reports 38
Safety in Fertilizer-Insecticide Mixing, by *Robert P. Henry* 40
Around the Map 44
Institute Honors Essay Winners and Editors 51
Personals 53
Obituaries 55
Regional Societies Hard at Work 56
Industry Calendar 56
CF Staff Tonnage Figures 60
Institute 1954-55 Consumtion Estimate 62
Morrow Plots Prove Power of Chemicals 65
CROP CHEMICALS
North Carolina's Methyl Bromide Story 66
Pesticide Exports Up in First Half 68
Classified Advertising 69
Advertising Index 70

COMMERCIAL FERTILIZER and PLANT FOOD INDUSTRY, entered as second class matter, October 12, 1910, at the post office at Atlanta, under the Act of March 3, 1879. Published monthly except semi-monthly in September, by Walter W. Brown Publishing Co., Inc., 75 Third St., N. W., Atlanta 8, Georgia.

Commenting Freely

by BRUCE MORAN

Fertilizer people are expressing themselves on the subject of the "Soil Bank" plan, I am glad to note. R. S. Maness of Aylward Fertilizer Company says it would be just like putting money in the bank. And he's right. Far better to store up fertility than to pile up surplus crops. There is coming a day when the famed "Fifth Plate" will need to be filled.

But it is a big question whether such a plan will get by the politics of the year ahead. As likely as not we will continue price supports of one kind or the other—and to store food at tremendous expense to the taxpayer.

We own five Billion dollars of wheat, for example, and price support operations through last June 30 have cost us almost 800 million dollars in actual net loss. But agriculture is the Achilles heel of the Republican administration, and will naturally have the hounds snapping at it all through 1956.

No wonder Ezra Benson says nobody in his right mind would want to be Secretary of Agriculture.

weigh all the facts before you build a

Extensive research and investigation of all the facts are necessary to make the building of a fertilizer plant economically sound. Where is the plant to be located? What is its proximity to supply? To distribution? How seasonal are demands in the plant area? What basic ingredients will be used more often? What return can be expected on the capital investment? These and many other facts must be considered in order to produce a sound enduring investment.

Many years of experience in the fertilizer industry have made Harte engineers cognizant of the over-all picture of fertilizer plant design, realizing that certain fundamentals must be followed while specializing the design of each plant. All possible facts are studied and adapted to fit each individual fertilizer plant.

The invaluable experience of Harte engineers is available to aid you in your fertilizer plant design. If you plan to build a fertilizer mixing plant, or an associated plant, the Harte organization of specialists can handle your complete job or any part from original design to an operating plant . . . assuring economy and speed.

Harte Engineers will be glad to discuss your plans with you, without obligation. Write today.

ENGINEERS

CONSTRUCTION MANAGERS

John J. Harte Co.

284 Techwood Drive, N.W., ATLANTA • NEW YORK • HOUSTON • MEXICO, D. F.

JUST AROUND THE CORNER *by Vernon Mount*

PRIVATE ENTERPRISE is doing the pump-priming these days, and keeping the economy at high levels. And the money that is going into plant expansions . . . 28 billions this year, 30 billions planned for next year . . . is not being spent just to make things look good.

COMING DEMAND is the whole foundation for such investments. Industry is getting ready for the 200 million Americans who will be moving up to retail counters five years from now, the children of the war years, grown, ready for their own homes and their own children.

LONG RANGE thinking is typical of business, but unfortunately is pretty rare among voters. So the very sources of our prosperity will be attacked in the coming campaign, frowned upon--perhaps even hampered in their good work by the mouthings of little men trying to get elected

Yours faithfully,

Vernon Mount

Farmers depend on ARMOUR FERTILIZERS

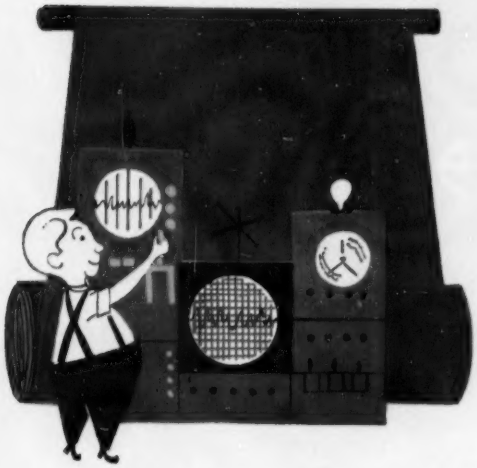
31 FACTORIES
CONVENIENTLY LOCATED
TO SERVE YOU

Albany, Georgia
Atlanta, Georgia
Augusta, Georgia
Baltimore, Maryland
Bartow, Florida
Birmingham, Alabama
Carteret, New Jersey
Chicago Heights, Illinois
Cincinnati, Ohio
Columbia, South Carolina
Columbus, Georgia
Dallas, Texas
East St. Louis, Illinois
Greensboro, North Carolina
Houston, Texas
Jacksonville, Florida
Jeffersonville, Indiana
Memphis, Tennessee
Montgomery, Alabama
Nashville, Tennessee
New Orleans, Louisiana
Norfolk, Virginia
North Kansas City, Missouri
Presque Isle, Maine
Sandusky, Ohio
Sigio, Tennessee
Waterloo, Iowa
Wilmington, North Carolina
Winona, Minnesota

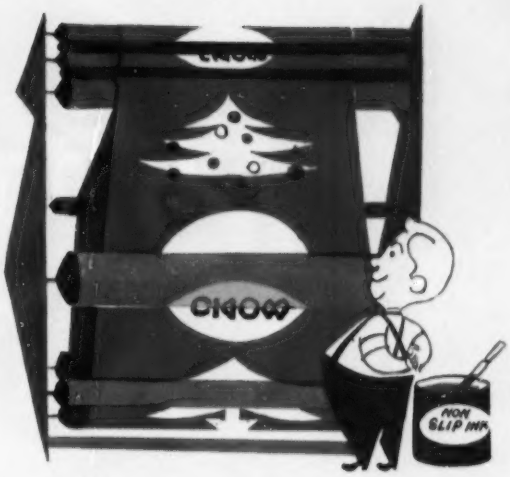
Also sales offices in Havana, Cuba, and San Juan, Puerto Rico

ARMOUR FERTILIZER WORKS

General Office, P. O. Box 1685, Atlanta 1, Georgia

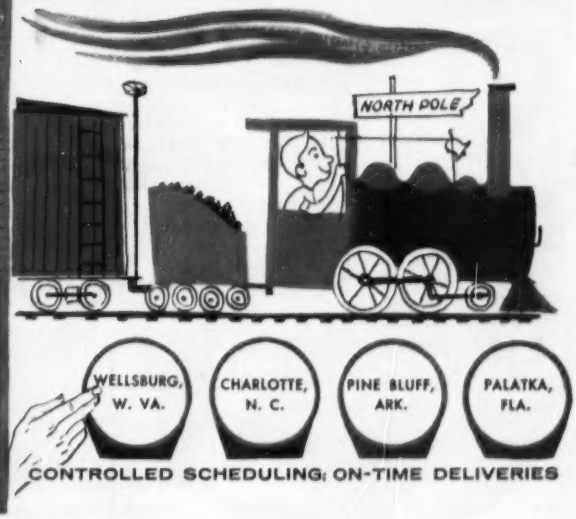


FROM TREES TO NUCLEAR SCANNED KRAFT...



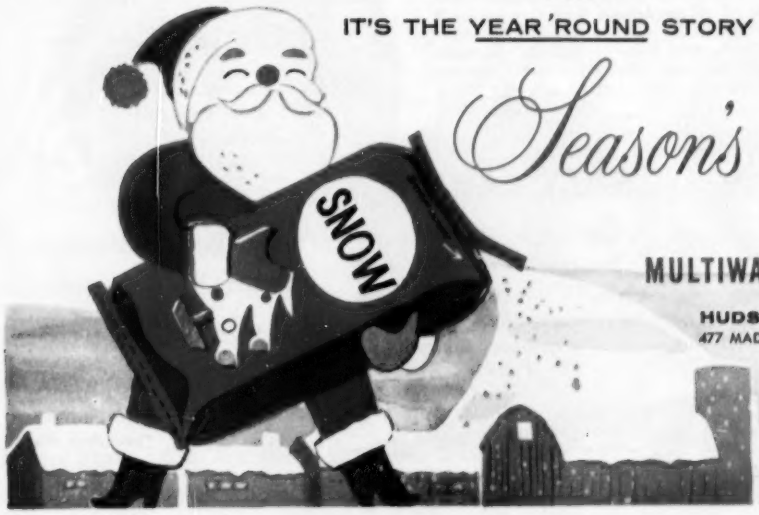
FINE PRINTING WITH A FLAIR FOR SELL...

RIGID INSPECTION AND THE "EXTRA" TOUCH...



CONTROLLED SCHEDULING; ON-TIME DELIVERIES

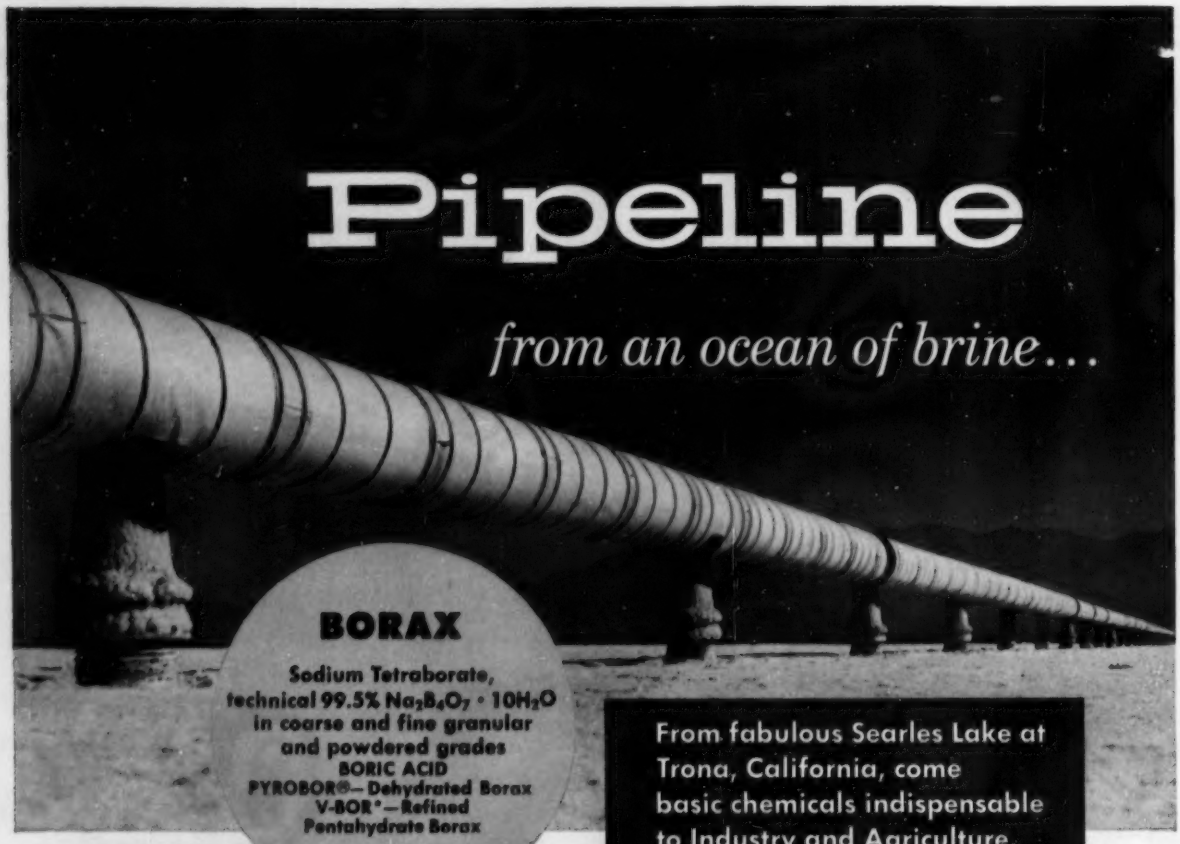
IT'S THE YEAR'ROUND STORY OF HUDSON MULTIWALLS!



Season's Greetings

MULTIWALL SACKS by HUDSON

HUDSON PULP & PAPER CORP.
477 MADISON AVENUE • NEW YORK 22, N. Y.



BORAX

Sodium Tetraborate, technical 99.5% $Na_2B_4O_7 \cdot 10H_2O$ in coarse and fine granular and powdered grades
BORIC ACID
PYROBOR®—Dehydrated Borax
V-BOR*—Refined Pentahydrate Borax

From fabulous Searles Lake at Trona, California, come basic chemicals indispensable to Industry and Agriculture.

POTASH

Agricultural Muriate 95-98% KCl, Chemical Muriate 99.5% KCl, and Sulphate 95-98% K_2SO_4

American Potash & Chemical Corporation

TRONA
INDUSTRIAL AND AGRICULTURAL CHEMICALS

Offices:	3030 West Sixth Street, Los Angeles 54, California 99 Park Avenue, New York 16, New York 214 Walton Building, Atlanta 3, Georgia
Export Division	99 Park Avenue, New York 16, New York
Plants	Trona and Los Angeles, California; San Antonio, Texas

LITHIUM

Lithium Carbonate, Lithium Chemicals, Lithium Ores

SODA ASH

Sodium Carbonate, technical 99.2% Na_2CO_3 58% Na_2O in granular and fine granular grades

SALT CAKE

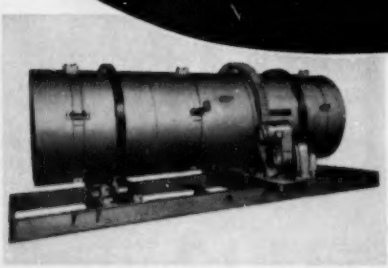
Sodium Sulphate Anhydrous, 97.0% Na_2SO_4 minimum, in regular and industrial grades

*Trade Mark AP&CC

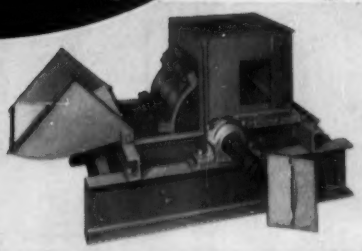
Producers also of—BROMINE CHEMICALS, and a diversified line of specialized agricultural, refrigerant and industrial chemicals

STURTEVANT FERTILIZER EQUIPMENT

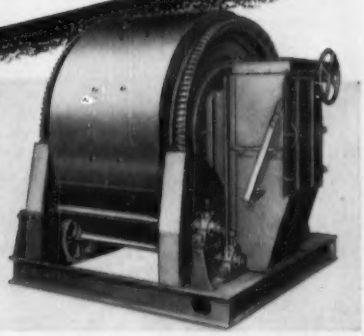
CUTS Cost of Fertilizer Manufacture



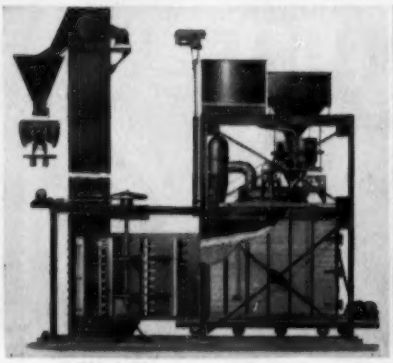
STURTEVANT FERTILIZER GRANULATING UNITS provide you with a complete process for manufacturing granular fertilizer. These efficient units can be supplied for various hourly tonnages and certain granule sizes depending on your particular requirements.



TAILINGS ROTARY PULVERIZER — increases output of fertilizer tailings . . . will not clog . . . leaves no daily accumulation of unground pellets. Capacities up to 25 tons per hour.



DRY BATCH MIXERS — 4-way mixing action mixes two or more ingredients into an inseparable, homogeneous blend. Open door accessibility makes cleaning easy. Capacities ¼ ton to 2 tons.



DEN AND EXCAVATOR—speeds processing of superphosphates. Easily operated by two men . . . produces 16 to 40 tons per batch and up to 480 tons per day of superior fertilizer free from lumps.

MICRONIZER® GRINDING MACHINE — A fluid jet grinding machine, the Sturtevant Micronizer speeds reduction of materials to low micron sizes. These jet mills are especially applicable in fields where a particle size in microns is desired.

MOTO-VIBRO SCREENS — screen everything screenable. Open and closed models with or without feeders. Many types and sizes . . . screens from ½" to 60 mesh.

For over 72 years, the Sturtevant Mill Company has been a leader in the design of plants and manufacture of fertilizer equipment. Equipment that has cut costs, increased tonnage throughout the industry.

Whether you plan to build a new plant, modernize or buy new equipment, it will pay you to consult Sturtevant Mill. Our engineers, specialists in fertilizer manufacture, are available for consultation. Ask for their services, today. You will keep ahead with Sturtevant.

STURTEVANT MILL COMPANY

111 CLAYTON STREET
BOSTON 22, MASSACHUSETTS

Designers and Manufacturers of:
CRUSHERS • GRINDERS
SEPARATORS • CONVEYORS
MECHANICAL DENS and EXCAVATORS
ELEVATORS • MIXERS

MR. FERTILIZER EXECUTIVE:

We know it is your desire and purpose to provide your customers with the most efficient fertilizer your "know how" and agricultural science indicates . . . BUT are you accomplishing this?

To answer YES, your fertilizer should contain ADEQUATE CONCENTRATIONS in a READILY AVAILABLE FORM of the ESSENTIAL TRACE ELEMENTS such as Copper, Manganese, Zinc, Iron, Magnesium and Boron.

If the essential trace elements are not present in adequate concentrations, you are not offering your growers a COMPLETE PLANT FOOD.

Join the ranks of the LEADING PROGRESSIVE FERTILIZER MANUFACTURERS . . . BOOST your SALES and FURTHER the MIXED GOODS INDUSTRY by manufacturing even better mixed fertilizers.

MAKE YOUR CUSTOMERS THE BEST PRODUCT POSSIBLE

Let TENNESSEE CORPORATION talk with YOU about our MINERAL MIXTURES program. The INEXPENSIVENESS and EASE of adding TRACE ELEMENTS should not be overlooked by progressive, PROFIT minded management.

Samples, specifications and detailed information available upon request.

TENNESSEE TC CORPORATION

617-29 Grant Building, Atlanta, Georgia

S

STEDMAN

FERTILIZER PLANT EQUIPMENT

Established in 1834

All Steel Self-Contained Fertilizer Mixing and Bagging Units

Batch Mixers — Dry Batching
Pan Mixers — Wet Mixing

Tailings Pulverizers - Swing Hammer and Cage Type

Vibrating Screens — Dust Weigh Hoppers

Acid Weigh Scales — Batching Hoppers

Belt Conveyors — Stationary and Shuttle Types

Bucket Elevators — Hoppers and Chutes

STEDMAN FOUNDRY & MACHINE COMPANY, INC.
Subsidiary of United Engineering and Foundry Company
General Office & Works: AURORA, INDIANA

NO SOUR GRAPES

Applying modern commercial fertilizers to the soil helps America's farmers bring in a fine crop of sweet, juicy grapes season after season.

Potash, a vital component of these fertilizers, not only enriches the soil, but protects crops against disease and increases yield and quality.

U. S. P.'s high-grade muriate of potash has the highest K_2O content and is free-flowing and non-caking—important advantages in the manufacture of fertilizers that help growers produce sweet grapes, and a sweet profit, too.

GENUINE STATE POTASH U.S.A. PRODUCT OF NEW MEXICO

REG. U.S. PAT. OFF.

HIGRADE MURIATE OF POTASH 62/63% K_2O
GRANULAR MURIATE OF POTASH 60% K_2O MIN.

UNITED STATES POTASH COMPANY

INCORPORATED

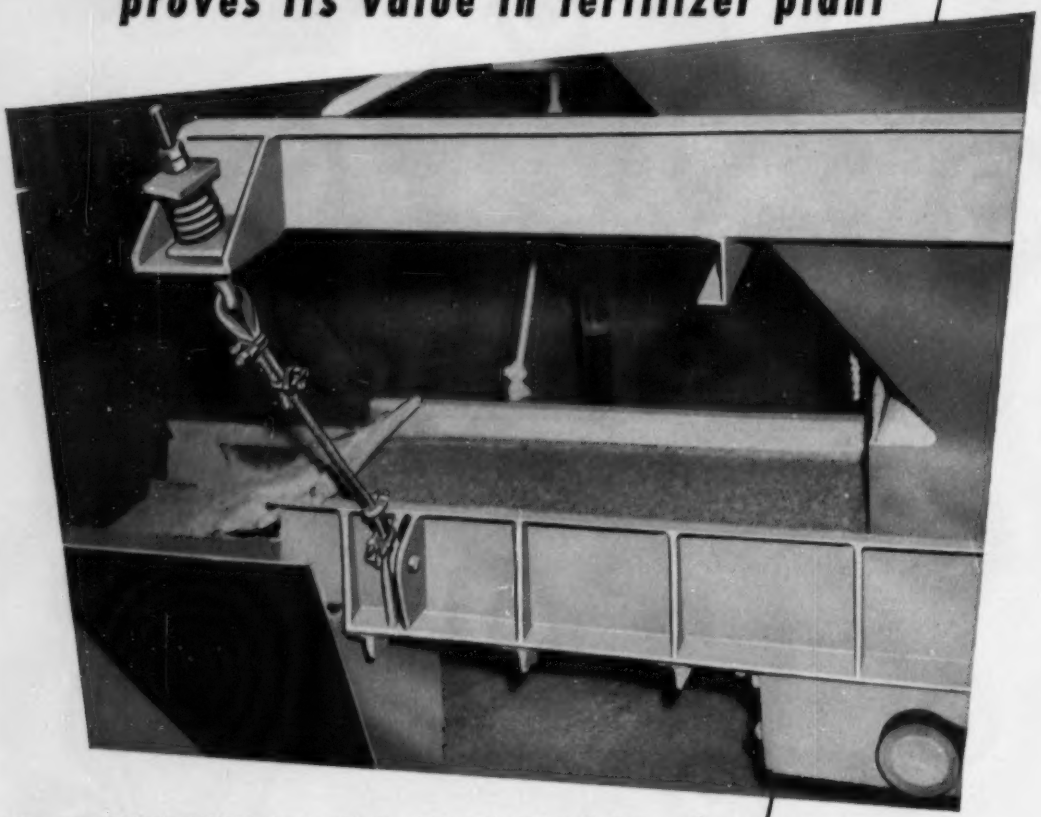
30 Rockefeller Plaza, New York 20, N. Y.

Southern Sales Office
Rhodes-Haverty Building, Atlanta, Georgia

SIMPLICITY

OS-A-VEYOR FEEDER

proves its value in fertilizer plant



Wisconsin FARMCO SERVICE Cooperative is utilizing this 18" x 6' Simplicity Os-A-Veyor Feeder to feed finished fertilizer from a bin to a bagger. The bagger is operating at 14 bags per minute. The rate of feed is controlled by a gate on the bin.

Simplicity Os-A-Veyor Feeders are designed to handle heavy column loads. They feed along their entire length and allow for the use of a larger bin . . . thus eliminating the problem of material bridging in the bin. Simplicity Feeders may be suspended with spring and cable arrangement from the bin above as shown in the picture, or may be spring mounted. They will feed on the horizontal, as pictured . . . thus requiring less headroom. They feature replaceable liners and can be provided with grizzly or screen sections, one or two decks, and can be totally enclosed. If a screening or feeding problem exists in your fertilizer plant, call on a Simplicity sales representative and find out about Simplicity units, now in wide use throughout the fertilizer industry.

Pictured here is a 2' x 5'6" Model JA Os-A-Veyor Feeder

Simplicity
TRADE MARK REGISTERED

ENGINEERING COMPANY • DURAND 3, MICH.

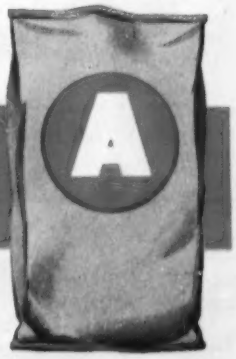
SALES REPRESENTATIVES IN ALL PARTS OF THE U.S.A.
FOR CANADA: Simplicity Materials Handling Limited, Guelph, Ontario
FOR EXPORT: Brown and Sites, 50 Church St., New York 7, N. Y.

160

"If the Skies Fall, One May Hope to Catch Larks"

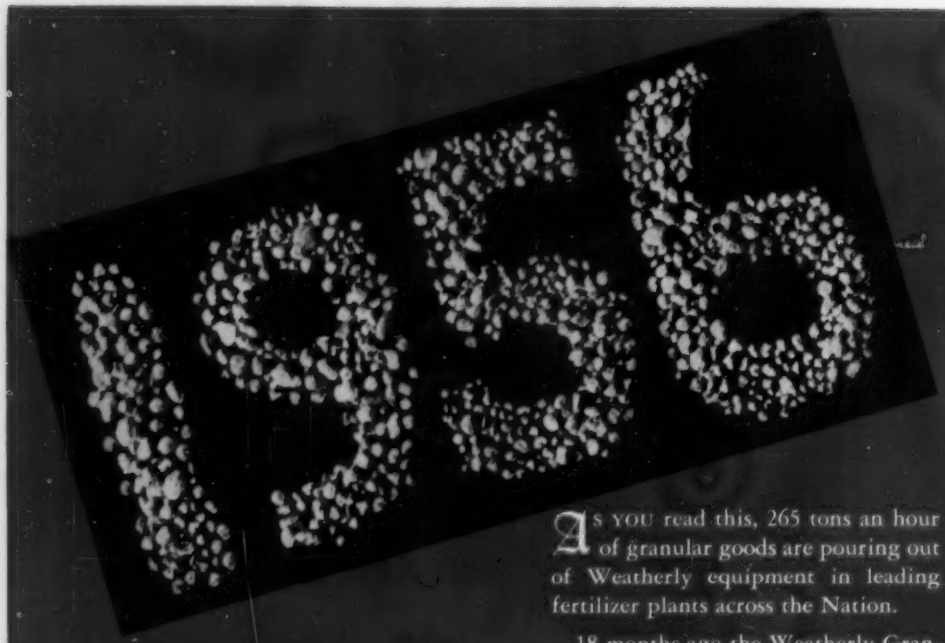
But when you order Multiwalls from the completely integrated Albemarle operation you do not have to depend upon *miracles* for superbly printed, superbly made sacks in *any* quantity you desire.

FOR *Multiwall* CALL *Albemarle*



ALBEMARLE PAPER MANUFACTURING COMPANY • RICHMOND, VIRGINIA

EASTERN SALES OFFICE: NEW YORK CITY • SOUTHERN SALES OFFICE: BALTIMORE, MD. • MIDWEST SALES OFFICE: CHICAGO, ILLINOIS



As YOU read this, 265 tons an hour of granular goods are pouring out of Weatherly equipment in leading fertilizer plants across the Nation.

18 months ago the Weatherly Granulation Process was unknown. Now it is the most talked about and the most fully accepted method in the field.

The products from Weatherly plants have become the standard.

Weatherly Controlled Granulation produces high quality goods from the lowest cost materials. Weatherly equipment is built with high quality, heavy-duty components.

As we round out our first season, we look back with gratitude and forward with expectations, and pause here for the heartiest wishes to our friends:

Merry Christmas
and
Happy New Year

WEATHERLY
GRANULATION
20-60 Tons per hour

The D. M. WEATHERLY COMPANY

Industrial Engineers and Builders

830 Ponce de Leon Ave., N.E., Atlanta, Georgia PHONE: ELgin 8384

Bemis Multiwalls made with RUF-GRIP kraft handle easily...and stack easily... and stay stacked. Consequently, they ship and store better. Get the details from your Bemis Man.

*TRADE-MARK

Also in the Bemis Family, Serving the Fertilizer Industry...

Burlap Bags

Cotton Bags

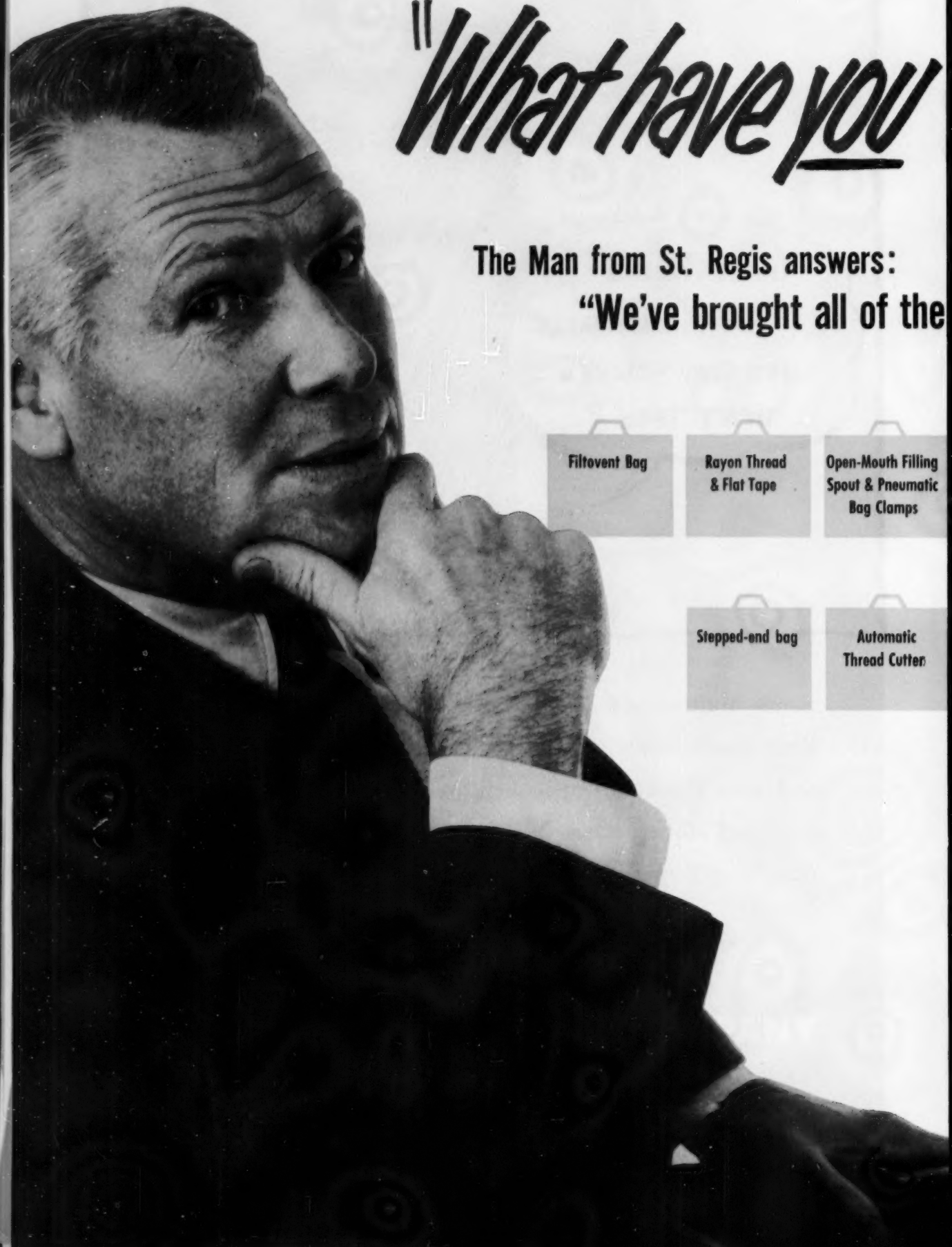
Waterproof (Laminated) Bags

Bemis

General Offices—St. Louis 2, Mo.
Sales Offices in Principal Cities

THE PURCHASING AGENT RIGHTFULLY ASKS—

"What have you



The Man from St. Regis answers:

"We've brought all of the

Filtovent Bag

Rayon Thread & Flat Tape

Open-Mouth Filling Spout & Pneumatic Bag Clamps

Stepped-end bag

Automatic Thread Cutter

done for us LATELY?"

following to our customers this year."

135 AS Scale

Literature Pouch Bag

Semi-Rigid Container & Baling Equipment

Fluopacker

Settler-Conveyor

Pasted Valve Bag for Fertilizer

Palletizing & Printing Manuals

"1956 DEVELOPMENT PROGRAM"

IN 1956, THE MAN FROM ST. REGIS will present more new features . . . new packages . . . new methods . . . new equipment . . . designed to merit your attention and *earn* an increasing share of your orders. If you are not already acquainted with those 1955 developments which can be of direct benefit to your operations, Ask the Man from St. Regis.

MULTIWALL PACKAGING DIVISION

ST. REGIS PAPER COMPANY

SALES SUBSIDIARY—ST. REGIS SALES CORPORATION
230 PARK AVENUE, NEW YORK 17, N. Y.

QUALITY
CONTROLLED
PHOSPHATES

THE CAR YOU MIGHT NEED TOMORROW IS ROLLING TODAY

If you suddenly find yourself on the spot . . . need a car or two in a hurry, there's usually one or more on track nearby which can be diverted to you overnight. That's the kind of routine service you can expect and get from *International*.

When you depend on *International* for phosphates, you have at your command a great reserve of service strength. Six mines and plants in Florida and Tennessee. Huge modern production facilities. Large storage capacity. A full range of grades of *quality-controlled* phosphates. Fast loading of rail cars or vessels to give you on-time, dependable deliveries to meet your normal and emergency needs.

FOR INDUSTRY
AND AGRICULTURE

- for the manufacture of complete fertilizers.
- for the manufacture of industrial chemicals.
- ground rock phosphate for direct application to the soil.

PHOSPHATE MINERALS DIVISION

INTERNATIONAL MINERALS & CHEMICAL CORPORATION

GENERAL OFFICES: 20 N. WACKER DR., CHICAGO 6 • Phosphate Mines and Plants in Florida at Noralyn, Peace Valley, Achan, Mulberry; in Tennessee at Mt. Pleasant and Weiner

THE NATIONAL GRANGE OUTLINES AN "EMERGENCY PROGRAM"

The National Grange November 25 outlined a broad program for "rebuilding family-farm income without dependence upon Government handouts." in concluding the 89th Annual Convention of the nation's oldest farm organization, which has 850,000 members.

Declaring that American agriculture, except for large commercial farming enterprises, is "in a state of emergency," the Grange called for a strong commodity-by-commodity approach to critical production, price and marketing problems.

The Grange criticized both the old 90% of parity rigid price supports and the current flexible price support program as inadequate to meet current and future needs of the great middle-income group of farmers. Government policies and action have contributed to the decline of agriculture, the Grange charged.

To meet the critical needs of agriculture and to build a sound basis for a "self-sustaining" program, the Grange recommended:

1. A vigorous export sales program at competitive prices to regain a fair share of world markets for American producers. This would include trade with the Iron Curtain countries.

2. Expansion and strengthening of soil and water conservation programs.

3. Use of two-price or multiple-price, self-financing measures for such commodities as can use them.

4. Development of farm programs on a commodity-by-commodity basis.

5. Expanded use of marketing agreements for all farm products that can successfully use them, and gradual decreased reliance on Federal price support programs.

Calling for a major over-hauling of agricultural programs, the Grange declared that "neither 90%, 75% nor 60% price support levels provide any assurance against the build-up of surplus stocks of major export crops as long as Government policies block the competitive sale of these commodities on the world market."

Price supports, the Grange said, should be used "only when necessary through the use of non-recourse loans and purchases to help achieve and stabilize farm parity income, to meet needed emergency adjustments, to reduce incentives for production of surpluses, and to help keep margins of profits to producers balanced between all farm products."

Lower price supports and tightened production controls have not accomplished the objective of lowering the national total of production, the Grange pointed out. "As one branch of the Government is sponsoring lower price supports and advocating production curtailment, another branch is restricting foreign sales and endorsing huge expenditures to expand the agricultural output of foreign nations that once were our customers," the Grange said.

The Grange "firmly believes that Federal farm programs involving the expenditures of public funds should be directed toward the middle-income group of farm families which receives all or a major portion of their income from farm operations."

Declaring that the economic position of family farms is "seriously deteriorating," the Grange said present agricultural programs for most commodities "have proved to be inadequate," the Grange called for "acceleration of efforts to develop a self-sustaining, stable agricultural economy" with "concentrated attention on ways and means of rebuilding family-farm income without dependence upon Government handouts."

"Efforts must be made to improve the economic position of the family-type farm, preferably through commodity transactions in the market place, but augmented by other measures if necessary.

"It is the unalterable position of the Grange that room must be preserved in American agriculture for families to engage in gainful work, on economic-sized units of land, as their own masters, and to make a decent living justly comparable with other parts of our society," the Grange said.

Quality Materials

Modern, Efficient Plants and Equipment

Exacting Standards and Rigid Inspection

Brilliant, Multi Color Brand Printing

Dependable Delivery Service.....make

Hammond Multi-Walls

THE FINEST SHIPPING SACKS OBTAINABLE FOR YOUR PRODUCTS

Hammond Multi-Wall Bags . . . shipping sacks of highest quality . . . are produced in three modernly equipped, strategically located plants. Our sales representatives, with offices in 11 principal cities, have a thorough understanding of your packaging problems and are at your service at all times. Why not call in the one nearest you today, from the list below. Let us show you what Hammond's quality and service can mean to you.

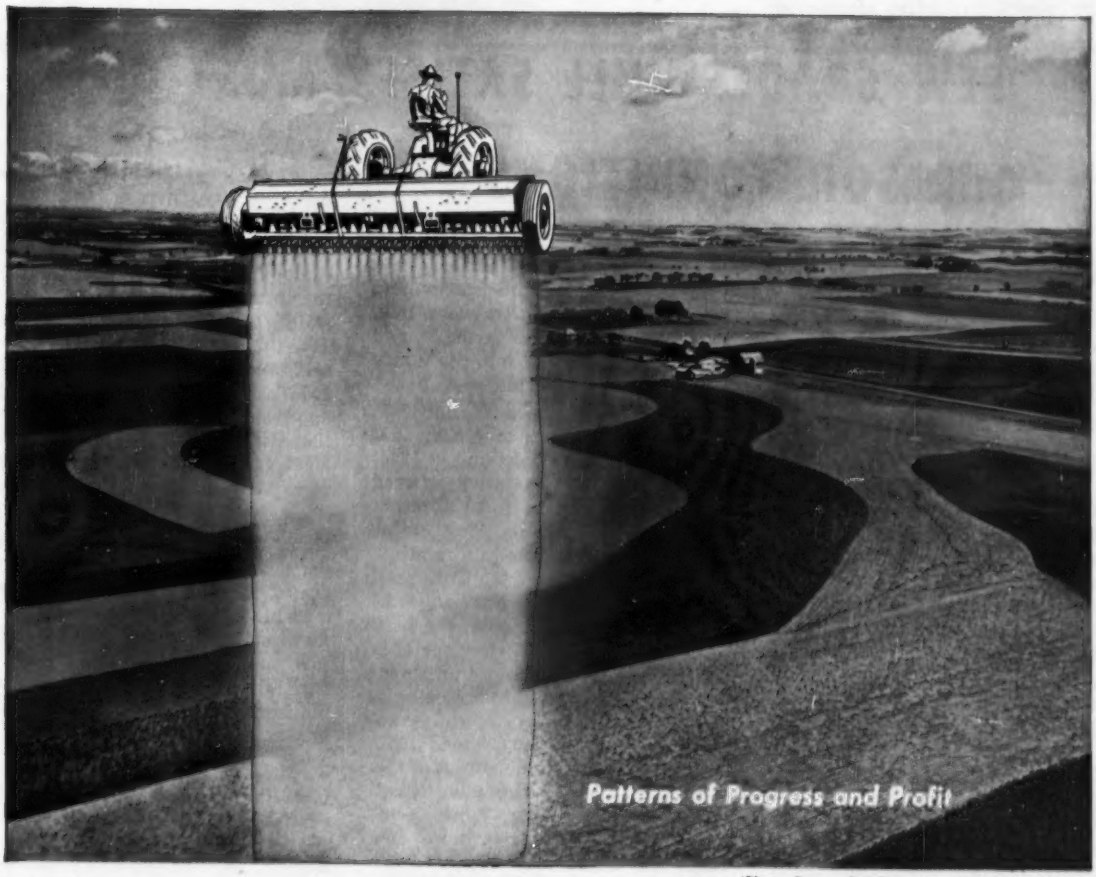
"TREES ARE A CROP"

For Multi-Wall bags, "Make it a Habit to Depend on Hammond"

HAMMOND BAG AND PAPER COMPANY, INC. General Offices: Wellsburg, W. Va.

Plants in Wellsburg, W. Va., Pine Bluff Ark., Charlotte, N. C. and Palatka, Fla.

Representatives in the following cities: New York, N. Y., Chicago, Ill., Minneapolis, Minn., Kansas City, Mo., Cleveland, Ohio, Atlanta, Ga., Baltimore, Md. Dallas, Texas, Charlotte, N. C., Ligonier, Pa., Bluefield, Va.



(Photo—Courtesy Soil Conservation Service, U.S.D.A.)

High Grade Muriate of Potash

by DUVAL

Duval Muriate of Potash ranks high as one of the essential nutrients which greatly increase yield and profits in crop production.

DUVAL SULPHUR and POTASH CO.
Modern Plant and Refinery at Carlsbad, New Mexico

Address all communications to:
ASHCRAFT-WILKINSON CO.
Exclusive Distributors
ATLANTA, GEORGIA
Cable Address: Ashcraft

NORFOLK, VA. • CHARLESTON, S. C. • TAMPA, FLA. • JACKSON, MISS. • COLUMBUS, OHIO • DES MOINES, IOWA

*Frank Boyd** SAYS THAT A FEW GRADES WILL SATISFY MOST OF OUR SOIL CONDITIONS

Down through the years we have had more fertilizer grades than could be accounted for on the basis of soil types and kinds of crops grown in any given region. In the early days the manufacturer most likely pulled the grade of his choice out of his hat without regard to any research finding with soils and crops. Then, too, the form and grade of fertilizer materials available, type of mixing equipment, economic conditions, and farm practices greatly influenced manufacturing procedures. The trend followed the line of least resistance among all those concerned with the manufacture and use of fertilizer.

A new day dawned with the establishment of an Agricultural Experiment Station in each state. In the beginning there was just one main station, generally located at the site of the agricultural college. Unfortunately many of these sites were not on soil types representative of the better farming areas. Admittedly this program was inadequate for an entire state made up of several distinctive soil regions. Probably an even greater handicap was the general attitude of the public in general, and the fertilizer industry in particular, toward scientific agricultural research and education. Time has brought about a gradual but definite change in the public's attitude towards all types of research information and its practical application to the farm.

This change has come about because the state experiment stations have enlarged their program to include substations on the larger and more important soil regions, experimental field stations on the smaller soil areas, and cooperative tests with individual farmers. Now the Agricultural Experiment Station System covers every important agricultural soil in the state. And added to this set-up every state has an official soil testing program that reaches down to every farm and to each field on the farm. So, let us take a look at some of the states and glance back to where we were, then study what we are doing today, and follow up with a look into the future for still better methods.

In Tennessee there is no legal limit to the number of grades that may be offered for sale, and in 1938-1939, for example, there was offered for registration and sale 85 different grades of mixed goods. Most of the tonnage, however, was in a relatively few grades. Today the College of Agriculture recommends only 12 grades but, as in the past, the bulk of the complete (NPK) tonnage is in six grades. With a large number of permissible grades, the "miscellaneous" or small-tonnage mixtures account for more than 10,000 tons (1951-1953), equivalent to the output of two small factories. Fortunately for all parties concerned, the Tennessee official soil testing laboratory now finds that any soil or crop need can be adequately fulfilled from the approved list of 12 grades.

Georgia is another state that permits unlimited registration and sale of fertilizer grades but through the fine cooperative effort of the College of Agriculture and the Georgia Plant Food Educational Society the soil testing laboratory only makes recommendations from a list of 12 approved grades of mixed fertilizer. Even with unlimited registration a mere handful of grades practically supplies all of the tonnage.

In Alabama the State Department of Agriculture very definitely restricts the registration of mixed fertilizer grades to a specific number—12 for 1955. The Departments of Agronomy and Horticulture of the College of Agriculture recommend ratios or grades to the State Board of Agriculture which, after a hearing with industry representatives, issues the approved list. As is true in other states, almost all of the tonnage is in half of the grades.

As a result of his experience in analyzing soil samples, the Director of the Alabama Soil Testing Laboratory has just recently stated that in his judgment Alabama needs only four complete (NPK) ratios or grades for the practical coverage of all the state's soils and crops. In the early days there were as many as 50 grades sold annually in Alabama, but in 1954-1955 only 12 grades are on the approved list, and for the future there is a good probability that 4 NPK grades and 3 OPK grades will meet all requirements.

North Carolina and Mississippi along with several other states have very strict legal requirements governing the number of grades permissible in their respective states. In these states the College of Agriculture and the State Department of Agriculture cooperating, work with industry in arriving at suitable grades. All other states are working along these same lines.

Now our host state, Louisiana, presents a slightly different situation in that each year certain "experimental" grades are added to the "approved" list on a trial basis, and "specialty" grades are permitted. On the surface this looks like a good deal, but in practice it has led to abuses and multiplied the problems of research, industry, and education in maintaining a reasonable list of grades. After all, proper ratios or grades can only be arrived at through research in the field and in the laboratory.

Louisiana, like the other states represented here, has an excellent experiment station system including substations, experiment fields, and cooperative tests with individual farmers, plus a soil testing laboratory, all adequately equipped and manned by scientifically trained personnel capable of solving the problems involved.

In the seven-year period 1944-1951, Louisiana had an average of 19 NPK grades with six grades representing 94 per cent of the tonnage. For the three-year period 1951-1954 the Department of Agriculture reported an average of 38 NPK grades

*By Frank E. Boyd, Agronomist, Virginia-Carolina Chemical Corporation.

with six grades supplying 82 per cent of the tonnage. This would indicate that Louisiana's grade situation is worsening while in most other states, the trend is towards the adoption of "approved" lists of fewer grades.

These improvements must come about through the cooperative efforts of research, industry, and education. The contributions of these three groups can best be coordinated through some organization to which all subscribe. The role of each group must be clearly defined, but in the end there can be only one unified program if the ultimate consumer is to have confidence in his advisors.

On this basis, we look to **research** to give us the basic facts from which may be selected the proper ratios of NPK or grades of fertilizer to balance the available soil plant foods for the crops to be grown.

The Experiment Station determines these ratios for the crops grown on the principal soils of the state. The station determines by field tests **what** to use in the form of such ratios and grades as 1-3-3 (4-12-12), 1-3-2 (4-12-8), or 1-2-4 (4-8-16) for cotton in the Coastal Plain or other region. Within a region there are many soil types, and farmer John Doe wants to know which grade to use for the cotton field with the fine sandy loam top soil and yellowish clay subsoil, and for the corn field with the brownish loam surface soil and reddish clay subsoil. Only by using the **laboratory soil test** procedure can John Doe learn **where** to put the grades previously determined by **field testing research.** In the laboratory the chemist simply finds out whether the soil content of available nitrogen (N), phosphate (P), potash (K), magnesium (Mg), calcium (ca) and other essential elements is in LOW or MEDIUM or HIGH supply.

Should the field test results show that cotton needs P and K in the ratio of 1 to 2, or low to high, and the soil test reports show that the soil P and K is in the ratio of high to low, then the fertilizer should carry a low to high ratio of P and K, such as 4-8-12 or 4-8-16. This means that if the field soil is high-low in P-K, then the fertilizer to match or balance the soil must be the opposite or low-high in P-K. (At this point a chart is used to illustrate this matching of the soil supply with fertilizer additions to give the crop a balanced ration as prescribed by station findings.)

To further illustrate how simple it is to reduce a large number of complete grades to four ratios or grades suitable for any practical farm need, let us analyze the 1952-1953 tonnage sold in Louisiana. This tonnage composed of 25 grades may be broken down as follows:

	1-1-1 RATIO			**Equal N-P-K**
	8-8-8	—	34,692 tons	
	10-10-10	—	2,924 tons	
	12-12-12	—	7,532 tons	
	13-13-13	—	2,231 tons	
Average	9-9-9	—	47,380 tons	—Suggest any 1-1-1 ratio.
	1-3-3 RATIO			**Varying N but equal P and K.**
	3-12-12	—	29,122 tons	
	4-8-8	—	65 tons	
	5-10-10	—	3,502 tons	
	5-20-20	—	1,764 tons	
	6-8-8	—	12,300 tons	
	12-8-8	—	827 tons	
Average	4-12-12	—	50,306 tons	—Suggest 4-12-12.
	1-2-3 RATIO			**Varying N but low P & high K.**
	3-9-18	—	154 tons	
	6-8-12	—	987 tons	
Average	6-8-13	—	1,141 tons	—Suggest 4-8-12
	1-3-2 RATIO			**Varying N but high P & low K.**
	4-12-4	—	15,074 tons	
	4-12-8	—	6,778 tons	
	6-10-4	—	2,015 tons	
	6-10-7	—	27 tons	
	6-12-6	—	540 tons	
	7-14-7	—	43 tons	
	9-18-9	—	703 tons	
	10-8-4	—	253 tons	
	10-10-5	—	205 tons	
	10-30-10	—	65 tons	
	10-20-10	—	618 tons	
	12-24-12	—	3,338 tons	
Average	5-14-6	—	29,660 tons	—Suggest 4-12-8

When the above breakdown is consolidated, we have this simple list of ratios and grades:

LOUISIANA GRADES	RATIO	TONNAGE	NUMBER GRADES	GRADE AVERAGE	SUGGESTED GRADE
Equal N-P-K	1-1-1	47,380	4	9-9-9	12-12-12
Varying N but equal P-K	1-3-3	50,306	7	4-12-12	4-12-12
Varying N, Low P—High K	1-2-3	1,140	2	6-8-13	4-8-12
Varying N, High P—Low K	1-3-2	29,660	12	5-14-6	4-12-8

The soil tester does not attempt to pin point his figures. To him, in testing for available phosphate, for example, "low" may mean anything below 50 pounds per acre, "medium" 50-100 pounds, and "high" any amount above 100 pounds. These levels or variations will change with the soil or with methods of extraction. In the same manner crop plants say it is not necessary to have the 12 grades in the above "high P-low K" group, but that varying rates of 4-12-8 plus sidedressing would meet their needs in the field. This system would also apply to potash, nitrogen, lime and other essential elements. It is not the plants and soils that are hard to please but man in his selfish desire to feather his own nest.

The whole problem resolves itself into knowing the crop needs, what the soil has to offer, and the amount and kind of fertilizer to balance the ration. That these conditions can be satisfied with relatively few grades is being recognized throughout the fertilizer belt. Some of the advantages of a few rather permanent ratios and higher grades over a multiplicity of constantly changing grades are: (1) **less** storage space required in factories, (2) **less** price spread between low and high grades, (3) **encourages** farmers to follow recommendations, (4) **less** cost per pound of plant food in higher analysis goods, (5) **easier** handling on loading platform, (6) **savings** in registration, tag and bag printing, record keeping and chemical control and, (7) creates more confidence on part of consumer.

The Experiment Station **gets the facts,** the educational groups **carry the message,** and industry **supplies the essential materials.** To be practical, the facts and the message must be such that industry can build the grades out of the materials available. This may mean compromise and coordination of effort among research, industry and education groups to the end that our farmers may be served.

USDA's "AGRICULTURAL RESEARCH" REPORTS ON SEARCH FOR FOOD QUALITY AND SOIL PROBLEMS

THE FOOD QUALITY FRONTIER*

Scientists are pushing into a dark region —nutritional relationships of climates, soils, plants, and animals.

In his quest for more food, man will have to think not only of high yields but also of soil management that returns **nutritionally richer crops.**

That's the conclusion of Director K. C. Beeson and his staff at USDA's Plant, Soil, and Nutrition Laboratory, Ithaca, N. Y., after 15 years of studying the basic nutritional relationships among animals, plants, soils, and climates. Though research has shed a little light, we're still in the dark ages on these matters.

Here are some significant facts:

Test animals grow differently on seemingly identical turnipgreens from soils in two Georgia locations.

Lambs grow poorly on soybean hay from low-phosphorus soils but respond to a phosphorus supplement.

Calves develop a goiter-like growth and won't gain on over-fertilized timothy hay in New Hampshire.

Cattle are unthrifty on forage from low-cobalt soils in North Carolina but thrive if fed mineral cobalt.

A few studies show the variety of factors that can affect the quality of food and feed plants. For example, the laboratory found some years ago that the amount of vitamin C in tomatoes depends on where they're grown. Soil differences were considered, but intensity of sunlight at ripening stage proved the principal cause.

Potatoes also differ widely in vitamin C, but the laboratory found that this is a genetic difference. ARS is now breeding high-vitamin-C varieties.

Then there is the soil factor. For several years the experiment stations of Georgia, North Carolina, Mississippi, Oklahoma, Texas, and Puerto Rico have been cooperatively studying quality variation in turnipgreens. They're important in many southern diets, and especially so to provide vitamin C for families using little milk or citrus fruit. The Ithaca laboratory joined in the study, using laboratory animals as a yardstick.

ARS nutritionist Louise Gray and associates, working in cooperation with the Georgia station, found that rats grow much better on turnipgreens from Blairsville, Ga., than on turnipgreens from Experiment, Ga., in another part of the State. Vitamin C didn't vary much—but the better greens contained a vitamin-B_{12}-like substance of which the poorer greens had little or none.

That's the first discovery of this nutrient or its precursor in plants. Its presence was proven with an organism that requires vitamin B_{12}, **Ochromonos leichmonii.** This grew on the better greens—also on the livers of B_{12}-starved chicks fed exclusively on the better greens. But the organism wouldn't grow on the poor greens.

Adding major and minor mineral nutrients to the Experiment, Ga., diet didn't help, but adding B_{12} restored full growth. We need to learn how to make plants a dependable source of this vitamin. Since bacteria build B_{12}, the researchers are looking to soil microflora, soil organic matter, and soil minerals—especially cobalt, a constituent of B_{12}—for an explanation. Soils in the area around Experiment, Ga., are deficient in cobalt.

Earlier ARS—North Carolina station research has shown that sheep and cattle are unthrifty when dependent on forage from a low-cobalt soil. This can be corrected by adding a trace of cobalt sulfate to soil or diet.

Another problem is the matter of toxic feeds. E. J. Thacker, G. H. Ellis, L. J. Daniel, G. D. Duncan, and Miss Gray have traced so-called zinc and molybdenum poisoning from retarded metabolism in animals back to mineral excesses in the soil on which their feed grew.

Excessive zinc in crop soils harms animal consumers of the crops in two ways. For one thing, extra zinc gets into the crop at the expense of copper, since the two minerals compete to nourish the plant (Agr. Res., Dec. 1954, p. 6). Rats on a copper-deficient diet couldn't make enough of two important copper bearing enzymes, ascorbic acid oxydase (forerunner to vitamin C) and tyrosinase (a tool in body use of inhaled oxygen). In the second place, excess zinc in the diet causes anemia —interferes directly with the rats' manufacture of another important enzyme, cytochrome oxydase, which helps use copper to make hemoglobin (red substance of the blood).

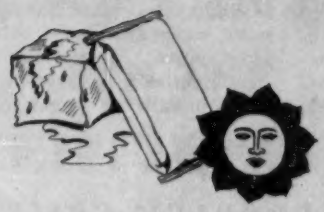
Poisoning from feeds grown on high-molybdenum soil, on the other hand, is an obstruction to body use of the important amino acid methionine. Such a diet stunted rats, but not when methionine was fed too. A copper supplement also mysteriously helped some, but only when the methionine wasn't supplied as an antidote.

Plants need a trace of molybdenum—also manganese—but too much of either poisons livestock. At Ithaca, J. F. Thompson found that plants use molybdenum to reduce nitrates, as generally believed, but contrary to opinion, don't necessarily use manganese that way. He wants to know how a plant uses these and other elements—whether for making chlorophyll or any amino acids.

So the study of amino acids in plants might reveal what the plant does with its soil-derived minerals.

Thompson found the amount of a mineral in the soil has little relation to the amount of amino acids formed in proteins in the plant, but a close relation to buildup of specific **non-protein** amino acids. This may lead to a new soil test by paper chromatography that simply, quickly, and inexpensively shows amino-acid con-

*From October issue.

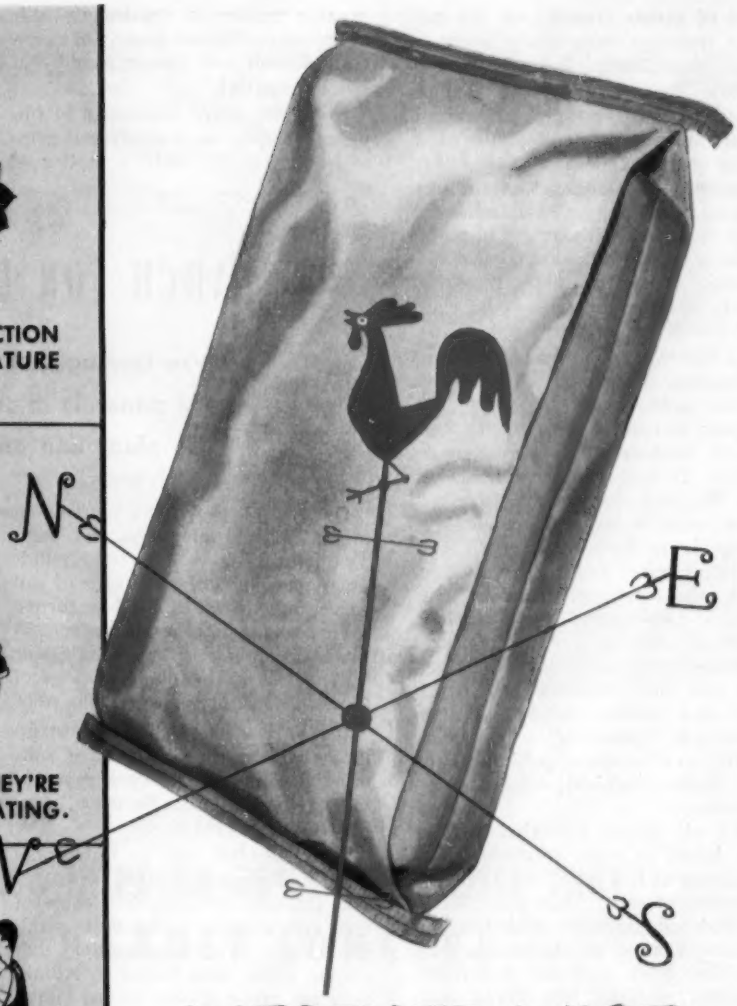


UTMOST PRODUCT PROTECTION OVER GREATEST TEMPERATURE RANGE.

SHIP WITH CONFIDENCE. THEY'RE STRONG—WILL TAKE A BEATING.

ELIMINATE "HARD-TO-HANDLE" COMPLAINTS. WORKMEN LIKE THEM.

GET THE FULL MERCHANDISING VALUE OF AN ATTRACTIVE DESIGN EXPERTLY REPRODUCED UP TO 4 COLORS.



WEATHER-WISE

PACKAGING WITH "ARKSAFE"

ALL-TEMP MULTIWALL BAGS

North — East — South — West . . . Your product is better protected when packed in "Arksafe" ALL-TEMP Multiwall Bags. ALL-TEMP LAMINANT is plasticized asphalt that remains flexible in cold climates — does not crack to allow moisture penetration — and doesn't bleed in warm weather. Far superior to multiwall bags made with an ordinary asphalt ply.

ALL-TEMP Multiwalls cost no more!

ARKELL SAFETY BAG COMPANY

10 East 40th Street, New York 16, N. Y.
6345 West 65th Street, Chicago 38, Ill.
Plants: Chicago, Illinois · Newport News, Virginia

tent of plants growing on the soil. Any deficient ones might point to the mineral lacking in plant and soil.

How does the mineral selenium cause stock poisoning? Thompson found that plants tend to use it in place of its chemical relative, sulfur, in making methionine. That, in turn, is used in making an essential amino acid, cysteine. Without sulfur, plants make a cysteine-like amino acid that doesn't satisfy an animal's sulfur need. So selenium poisons by causing sulfur hunger.

In this work, Clayton Morris and Thompson discovered an unknown amino acid—methyl cysteine sulfoxide—in turnipgreens. Quite similar to methionine, it also contains sulfur. To find whether animals can use the new compound instead of methionine in making cysteine, he'll apply it to liver (the organ that builds cysteine) and culture the liver with the cysteine-dependent bacterium **Leuconostoc mesenteroides.** Bacterial growth would prove that cysteine had been produced. Thompson will also check the new amino acid as a possible antidote for molybdenum "poisoning"—in other words, as a means of getting around the faulty methionine-cysteine dependency.

Not all animal nutrition diseases are linked to trace minerals (those occurring at less than 20 pounds per acre-foot of soil). Take phosphorus. G. Matrone, formerly with the laboratory, worked on phosphorus with the New York (Cornell) and North Carolina stations. He found low-phosphorus soils yield nutritionally inferior legumes. Lambs gained little or none on hays from such soils—only a half to two-thirds as much on soybean hay from the latter State. Rabbits fed such hay developed weak bones. Phosphorus supplement solved the problem, especially when supplied through soil and crop.

Curious as to the best rate for fertilization, dairy husbandman H. A. Keener, of the New Hampshire station, fertilized a timothy crop near Durham very heavily and fed the hay to 3-month-old calves. The calves formed a goiter-like enlargement of the thyroid and failed to gain normally until other hay was substituted. Thacker got similar results with rabbits fed this hay. Even supplementing with the known mineral constituents of alfalfa, or alfalfa ash with the inferior timothy, brought about normal growth. Why? Thacker thinks phosphorus in the timothy planting may be a factor—doubts that current tests will show any connection with iodine.

It has been suggested that adding organic matter to low-humus soils improves nutritional quality of crops. C. S. Brandt and Beeson found that has little effect.

Now that we're beginning to understand some basic nutritional principles better, it's only a matter of time until scientists turn these discoveries to farm use.

While pressing the search for even more basic knowledge of the soil-plant-animal nutrient relationships, our scientists have started mapping our minerally abnormal soils.

SEARCH FOR PROBLEM SOILS

We're finding that abnormal content of trace minerals in many soils is affecting plant and animal nutrition

Our soil types—their content of major mineral elements and their productivity—have been largely outlined through half a century of soil surveying. Now, USDA has turned to locating soils that have an abnormal content of trace minerals that affect nutritional quality of foods or feeds grown on those soils.

It's only a start, but important. (Some of the consequences of soil-mineral abnormality were reported in "Our Food Quality Frontier," Agr. Res., October 1955, p. 3.)

The effect of soils on nutritional quality of crops first attracted attention through nutritional diseases of men and animals whose diets originate locally. It's a familiar story that human goiter was traced to iodine-deficient crops grown on low-iodine soils. Those soil areas now are largely delineated. They're in the interior of the country. But other human-disease links to soil aren't so evident because modern man tends to gather his diet from the four corners of the land—from many soils.

Livestock is a better indicator. Since farm animals generally feed from a single farm, they may have a nutritional disease directly traceable to that farm's abnormal soil. This fact helped scientists link runtiness of ruminant animals in some eastern localities to cobalt deficiency existing in the soils and crops there.

With such clues, K. C. Beeson, director of the ARS Plant, Soil, and Nutrition Laboratory, Ithaca, N. Y., and North Carolina experiment station researchers spot-checked suspected areas and analyzed crops for the trace of cobalt they contain.

Measuring trace elements is a slow precision job. The scarcer the element, the more exacting the job. So Beeson joined V. A. Lazar and S. G. Boyce, of Ohio University, in search of better indicator plants—species that store micronutrients plentifully and proportionally to their content in the soil. Swamp blackgum and pepperbush are good indicators of cobalt, zinc, copper, and manganese — gallberry and sweet bay, good indicators of zinc and manganese. This finding gives greater speed and assurance in tracing problem soils. And the help of other stations should greatly expedite the search.

Spot checks show cobalt is deficient in many localities from the Upper Great Lakes eastward and southward to the Gulf. We should be able to pinpoint our areas of severest cobalt deficiency within a matter of years, rather than decades, as recently seemed the case. The cobalt needs of our feed crops are being worked out. Correction by supplementing our deficient soils or feeds with cobalt may become standard practice in the foreseeable future.

The indicator-plant approach is encouraging. Selecting the indicators is more complicated, however, than merely finding what plants are heavy users of a particular mineral. Beeson and Cornell agronomist H. A. MacDonald found that mineral content may vary quite a bit in a given species depending on its stage of maturity and also on the part of the plant that is being tested.

Timothy has its greatest copper content early in growth, approaches maximum for manganese at midseason, and is richest in manganese, iron, and cobalt—but poorest in copper content—late in the season. Legumes are richest in iron and copper at midbloom stage. It's important to understand each species' maturity factors relative to each mineral and to test plants at their best stage.

*From November issue.

A BONANZA FOR THE FERTILIZER INDUSTRY!

CASH IN ON THE DEMAND FOR THE NEW UREA-FORM NITROGEN 38% N. FERTILIZER THAT WORKS HARDER LONGER!

UREA-FORM isn't just another fertilizer . . . it's a great new 38% nitrogen that feeds evenly and safely all season long! One application feeds all the nitrogen needed for an entire crop!

UREA-FORM won't burn, won't leach—it's not like other soluble or organic fertilizers. A product of 15 years of research, it's sanitary, odorless, good for all turf, trees, plants, crops and pastures!

- ★ **FEEDS LONGER** . . . 24 weeks or more . . . one feeding lasts entire growing season.
- ★ **FEEDS EVENLY** . . . no soft extravagant growth . . . promotes steady, healthy development.
- ★ **FEEDS SAFELY** . . . won't burn even in high temperatures and bright sunlight areas.
- ★ **NON-LEACHING** . . . stays put, won't wash away; won't make harmful salts either.
- ★ **ECONOMICAL** . . . saves up to 6 times the labor, storage space & handling you now need.

NITROFORM N AGRICULTURAL CHEMICALS

NITRO-FORM AGRICULTURAL CHEMICALS
Division of Woonsocket Color & Chemical Co.
WOONSOCKET, R. I.

The nutrition staff still gets most of its guides to problem areas from other scientists who have observed nutritional ailments in animals. Some of the most spectacular problems are the mineral toxicities reported from western range lands. Beeson has spent most of the past summer with a party of scientists investigating toxic conditions of cattle and sheep in Utah and Idaho.

Veterinarians Wayne Binns and W. T. Huffman (retired), of ARS, animal nutritionist L. E. Harris, of the Utah experiment station, and Beeson visited high mountain ranges in Utah. Cattle and sheep there are subject to the deformity, big brisket disease, and to other forms of malnourishment. In Idaho, mountain-valley meadows were studied in connection with lambs born with extremely deformed heads. The disease is sometimes called monkeyface.

Molybdenum toxicity of livestock previously had been identified with plants growing in high-molybdenum soils in some of these areas. So that or some other mineral toxicity was suspected. Soil scientists W. O. Robinson and J. Kubota, of the Soil Conservation Service, and Beeson extensively sampled the vegetation and soils on these problem ranges.

Samples analyzed from a 1954 trip to the same general areas proved inconclusive. This showed a need for good indicator plants and a reliable sampling procedure for each mineral in question. Beeson hopes to learn whether selenium and molybdenum build up as plants get older, and also whether the soil abnormalities are spotty, as the scientists thought.

In some places vegetation grows largely on powdered rock, rather than soil in the usual sense. These materials are very high in molybdenum, selenium, uranium, vanadium and iron. Molybdenum and possibly iron interfere with the animal's important storage of copper in the liver. On copper-deficient soils, these interferences are increased.

Peat beds are fairly common in poorly drained spots. In many cases these beds—likely sites of mineral abnormality—afford the only browse in summer droughts. It is thought that seepage into these low spots carries a toxic element, which thus accumulates and is absorbed in large quantities by the vegetation.

For the country at large, boron is the one micronutrient most generally deficient with respect to crop yields. It's short throughout New England and in many other eastern areas. Zinc is low in many soils of the Southeast and West Coast. Manganese deficiency, on the other hand is not frequently found in nature, though too much calcium keeps plants from taking up enough manganese.

In studying the South Carolina Coastal Plain, the nutritionists found that land form and geology have something to do with the amount of calcium, phosphorus, cobalt, copper, iron, and manganese in the soil. Low plains at 25 to 42 feet above sea level had a very low content of these elements, whereas lands at 100 to 170 feet elevation were somewhat better supplied. Two river basins in this area were generally low in phosphorus, cobalt, copper, and iron, but high in calcium and manganese. Findings such as these lead to shortcuts and should expedite survey work.

One of the biggest advances so far in expediting survey work is a new quick plant-assay technique adapted by C. S. Brandt for the laboratory. Specimens of plant material, reduced to ash, are exposed to an X-ray spectograph. The rays are refracted to a different degree by each mineral in the plant and are thus arrayed in light bands. The instrument identifies each band by wavelength with the mineral that caused it and measures the element's concentration. This method opens the way for large-scale testing and mapping problem soils.

It's a big job locating soils abnormal in trace minerals. The nutrition staff hopes that as it opens up new problems and finds new criteria, to aid in the search, other agencies will find the problem areas.

Georgia Short Course Attracts 115

Farmers are using far less fertilizer than the amount recommended by agricultural experiment stations and the college of agriculture, according to facts brought out at the Georgia "Soils and Fertilizer" Short Course for commercial fertilizer men November 1 at Abraham Baldwin Agricultural College held with the cooperation of Georgia Coastal Plain Experiment Station.

Dean T. M. Cordell, short course director at ABAC, had charge of the program, which was attended by 115 commercial fertilizer dealers, manufacturers and salesmen from over Georgia.

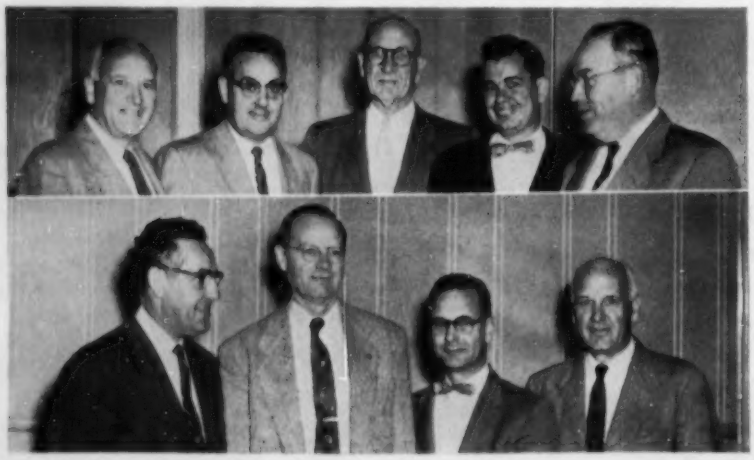
Marketing Talk

Ed Young of Dawson Cotton Oil Co., spoke on "Marketing Fertilizers". R. L. Carter, soil scientist with the Experiment Station spoke on Soil Tests.

Jeff Davis, of Southeastern Liquid Fertilizer Co. of Albany, discussed liquid fertilizers.

Other speakers included: President George F. Donaldson of ABAC and Dr. Frank P. King, director of the Experiment Station, who welcomed the fertilizer men; Loy Everett, vice president of Georgia Plant Food Educational Society and manager of V. C. Fertilizer plant in Albany; J. E. Elder, manager, Swift Fertilizer plant in Albany; Harry Johnson, state chemist for the state department of agriculture, Atlanta; and Dr. Harold Morris, professor of agronomy at the University of Georgia.

Fertilizing to meet nutritional needs was discussed by several technicians of the Coastal Plain Experiment Station, including: S. A. Parham, general field crops; J. D. Miles, tobacco; O. J. Woodard, horticultural crops; and J. L. Stephens, grazing crops.



Above: Attending the Western Ohio Regional Lime and Fertilizer Conference, from left to right: John Slipher, Extension Soil Conservationist, Ohio State University, Columbus, Ohio; Malcolm H. McVickar, National Plant Food Institute, Washington, D. C.; E. P. Reed, Extension Agronomist, Ohio State University, Columbus, Ohio; R. R. Davis, Agronomist, Ohio Agricultural Experiment Station, Wooster, Ohio; and George Enfield, Soil Specialist, U. S. Department of Agriculture, Washington, D. C.

Below: At the Regional Fertilizer and Lime Meetings in Eastern Ohio—From left to right: Malcolm M. McVickar, National Plant Food Institute, Washington, D. C.; D. T. Herman, Ohio ASC Committee, Columbus, Ohio; Gordon J. Ryder, Extension Agronomist, Ohio State University; and Wilbur Hadgers, Marble Cliff Quarries Company, Columbus, Ohio.

One sharp pull – and you have a smooth, clean multiwall opening for precision-pouring. The smoothest bag opening feature available – either for sewn valve or sewn open mouth bags – is the new A&S Zip Top bag.

Wasteful "buckshot" pouring is eliminated because Zip Top – *with almost* no effort – provides a clean, controlled opening to empty all of its contents. Economy and customer-satisfaction are assured all around.

The new Zip Top feature is added to the other A&S multiwall advantages. You get outstanding colorful designs – clean, sharp printing – specification bag paper supplied by 4 big mills – the best possible combination of research and services. A&S customers are assured the experience and imagination of "the oldest name in paper bags" – almost a century of dynamic packaging and merchandising know-how.

To learn more about Zip Top – and other important special-packaging advantages–address the Package Engineering Department, Canajoharie, New York

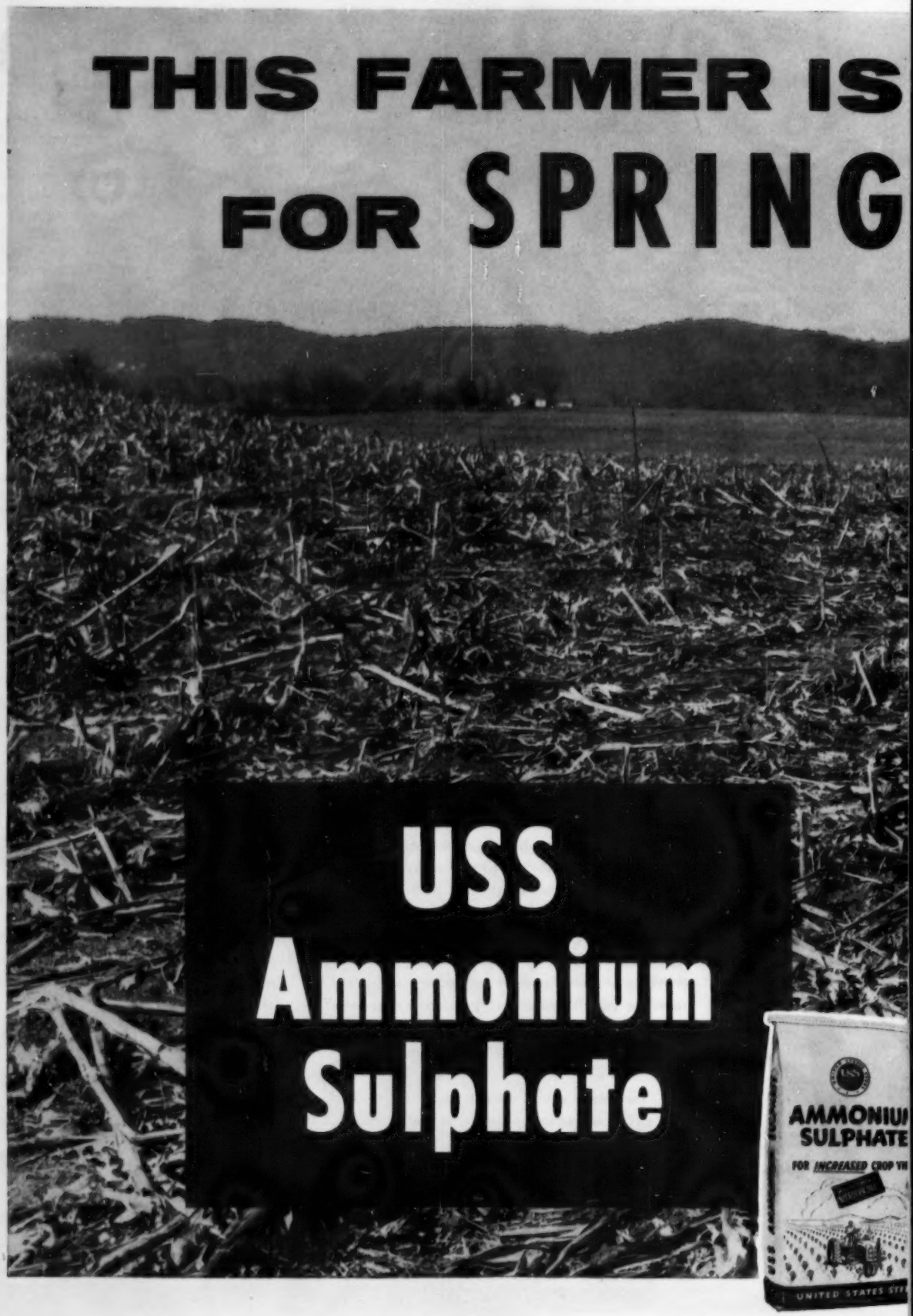
ARKELL and SMITHS

500 Fifth Avenue, New York 36, N. Y.

"THE OLDEST NAME IN PAPER BAGS"

**Patent applied for.*

Manufacturing Plants at: CANAJOHARIE, N. Y. • WELLSBURG, WEST VIRGINIA • MOBILE, ALABAMA • HUDSON FALLS, N. Y.


THIS FARMER IS
FOR SPRING
USS
Ammonium
Sulphate
AMMONIUM
SULPHATE
FOR INCREASED CROP YIELDS
UNITED STATES STEEL

READY
FERTILIZING
. . . ARE YOU ?
More farmers than ever before realize that USS Ammonium Sulphate can be applied any time the ground is free of snow . . . even BEFORE the soil thaws . . . without worrying about the nitrogen leaching out. They know, too, that early fertilization of pastures, wheat and cornfields saves valuable time for the big spring planting rush. These facts mean that your customers will be calling *you* for a supply of USS Ammonium Sulphate, soon. Make sure you're not caught short. Order your spring supply of USS Ammonium Sulphate—right now!
Sales Boosters
To make sure the spring fertilization program gets off to a good start, advertisements encouraging early fertilization will appear in state and national farm magazines reaching over two-and-half-million farmers. These ads will result in SALES! Be sure *you* cash in on this sales-boosting campaign by reminding your customers that you are ready to supply them with non-leaching USS Ammonium Sulphate.
USS
SEE The United States Steel Hour. It's a full-hour TV program presented every other week by United States Steel. Consult your local newspaper for time and station.
UNITED STATES STEEL

Masterpieces on KRAFT

SOME OF OUR CUSTOMERS are genuinely surprised at the clean, fresh, "contrasty" colors we can produce on kraft Multiwalls.

Much is due to our painstaking efforts to develop design and color schemes best suited to the product.

Much . . . *very* much . . . is due to our exclusive Kolorseal process of printing which assures our customers fast, clean colors and perfect registration.

May we show you comparative printings made by our Kolorseal process?

We think you, too, will be surprised. . . . A line from you will bring convincing evidence to your office . . . and *without* the slightest obligation!

THE RAYMOND BAG COMPANY
Middletown, Ohio.
Phone 2-5461

Raymond

MULTIWALL PAPER SHIPPING SACKS

HOW *New York* STRIVES TO DUPLICATE IDEAL YIELD CONDITIONS

By N. C. BRADY, Department of Agronomy, Ithaca.

All of us have wondered from time to time why we cannot consistently obtain maximum yields of our crops in New York State. Even when we carefully choose our soil, use the best hybrid or variety available to us, fertilize heavily, and in some cases apply irrigation, we still are unable to obtain yields which we know have been obtained occasionally in the past. It would be of great practical benefit to all of us to be able to know what the various factors are which control the growth of crops during a given growing season. Is it the weather, fertilizers, excess moisture, or something else?

To answer these and other similar questions, the Agronomy Research Farm near Aurora, N. Y., was purchased by Cornell University some 7 years ago. This farm, which comprises a total of 270 acres, is located on soils that are typical of west-central New York. They are known as "high lime soils" and include types such as the Honeoye and the Lima silt loams. They are among the most productive in the State, and represent a wide area in western New York. Thus, results obtained at the Aurora Farm should apply to most general crop farms in western New York.

Extensive Experiments Set Up

Although researchers working on this farm do not expect to answer very quickly the questions as to what limits the growth of crops, they have set up a number of elaborate experiments to try to determine what influence weather, fertilizer nutrients, irrigation water, and so forth, have on the yield of crops. To do this, they expect to measure, at frequent intervals, such things as air temperature, leaf temperatures, moisture in the atmosphere, moisture in the soil, and nutrients that are available to plants. Some of these measurements will be made out in the open as well as in the midst of the growing plants. By so doing, researchers hope to be able to determine the environment in which these plants are grown. The crops being grown in rotation in this particular experiment are corn, oats, wheat, alfalfa, and clover.

Among the other tests being carried on at the Aurora Experiment Station is a large rotation experiment. A total of nearly 900 plots of land are being managed in different ways in this test. Rotations varying in cropping intensity from continuous corn to continuous sod crops are included. Various fertilizer practices are compared on each of the rotations. In addition, the influence of tile drainage on corn production is being determined. This rotation experiment includes most of the major field crops grown in New York State.

Weed Control For Small Grains

The Agronomy researchers are also carrying on a number of weed control investigations on or near the Aurora Farm. Their main objective in this particular area is to find chemicals that will control such weeds as mustard and yellow rocket, but that will allow new seedings of small grains to grow normally. Several chemicals now under investigation show great promise in this respect but require additional testing before they can be recommended.

Fertilizer experiments are also under way at the Aurora Farm. Nitrogen solutions, as well as anhydrous ammonia, are being used in the production of corn and small grains. The possibility of fall applications of these materials is being tested, since this practice would give a more even distribution of fertilizer consumption during the season. In addition, new phosphate materials and phosphate nitrogen mixtures are under test. Of course the field investigations are followed carefully by laboratory studies.

The Aurora Farm is one of the major testing areas used by the Plant Breeding Department in testing their corn hybrids. An area of some 45 acres is devoted to this kind of research and the rotations which must be carried on to make such testing possible. In addition, the Departments of Agronomy and Plant Breeding are comparing various varieties and strains of forage crops, such as birdsfoot trefoil, alfalfa, red clover, timothy, and bromegrass. Although these crops are used mostly at this farm for forage production, some work is being conducted on birdsfoot trefoil to determine ways and means of increasing the seed production of this very important legume crop.

Disease and insect control studies are another phase of the research. For example, the influence of corn stalk rot and wheat rust is being determined for these important field crops.

Although research work has been carried on at the Aurora Farm for a short period of time only, the results coming from this area have been of considerable help in determining departmental recommendations for farmers in New York State. Groups have visited this farm to look over the research data and plots. For example, on July 14 about 300 farmers and research workers attended a field day to look over the research work under way. It is expected that in the future regular field days can be held at this farm to give the public a chance to see the type of research that is going on. Growers and county agents in west-central New York are encouraged to visit the farm whenever possible, particularly at times when regular tours are being held.

The Aurora Farm operation is under the direction of Dr. R. B. Musgrave of the Agronomy Department. In addition to supervising the routine cultural operations for all experiments, Dr. Musgrave is in charge of much of the field work dealing with rotations and the influence of weather on crop production. He also has major responsibility for the operation of a second research farm near Ithaca—the Mount Pleasant Research Farm. Dr. Musgrave and his colleagues are confident that research presently in progress at these two stations will have a marked effect on agronomic practices in New York State.

*From "Farm Research"—Cornell Ag pub-

600 ATTEND CFA

More than 600 delegates to the Thirty Second Annual Convention of the California Fertilizer Association, held at the Mark Hopkins Hotel in San Francisco November 6, 7 and 8, heard J. Earl Coke of San Francisco suggest that it is unsound to propose an agricultural shortage economy. He said that the American way of life is based upon an abundance of food and fiber. Coke is vice president of the Bank of America, former Assistant Secretary of Agriculture and former Director of Agricultural Extension for California.

He said that surpluses should be managed so as to limit the supply to that of the highest quality and that we should produce for use rather than for storage. He pointed out that most of the agricultural commodities no win surplus supply are not of high quality, and said that the best or our production is readily disposed of. However, he said, the crop support program places as much value on poor as it does on high quality. Coke expressed the thought that the present program of the Department of Agriculture, if undisturbed, will restore our competitive position in world markets.

Coke pointed out that proper use of commercial fertilizer and other approved cultural practices permit reduction of acreage, at the same time increasing net farm income, because they combine to lower the per unit production costs. He said that crop loan agencies should provide adequately in the loan budgets, and insist upon the use of proper fertilizers to add security to their loans.

The talk by Dr. Russell Coleman, executive vice president, National Plant Food Institute is presented here in full.

A new feature was a panel discussion in which the membership enthusiastically joined on the subject "Importance of Soil Fertility and Plant Nutrition in the Sound Marketing of Fertilizer Materials." Moderating was Dr. D. G. Aldrich, Jr., Chairman of the Department of Soils and Plant Nutrition, University of California, Davis. Panel members were Dr. J. E. Knott, Chairman, Department of Vegetable Crops, University of California, Davis; F. Leavitt, Senior Agricultural Technologist, Shell Chemical Corporation, San Francisco; Dr. Guy F. MacLeod, Technical Vice President, Sunland Industries, Inc., Fresno; Howard H. Hawkins, Golden State Plant Food Company, Glendora; and Gordon Bixler, Associate Editor, Journal Of Agricultural And Food Chemistry, San Francisco.

The panel discussion was directed toward increasing the value of service rendered to agriculture by the fertilizer industry. It was pointed out that fertilizer salesmen exert much influence on farmer purchases and that knowledge of soil and crop needs in the areas they serve is important. The industry has a continuing responsibility in providing the materials best suited for each crop and locality, it was said. Public information on the subject of fertilizers was said to be developing on a sound basis.

The Association membership elected four Directors—V. A. Frizzell, Salinas, one year term; Howard H. Hawkins, Glendora, re-elected to a three year term; and William G. Hewitt, Berkeley, and M. M. Stockman, San Francisco, both for three year terms.

The new Board of Directors elected these officers to serve for the next year: William E. Snyder, Wilbur-Ellis Company, Los Angeles, President; Jack Baker, Bandini Fertilizer Company, Los Angeles, Vice President; Howard H. Hawkins, Golden State Plant Food Company, Glendora, Secretary; William G. Hewitt, Pacific Guano Company, Berkeley, Treasurer; and it re-elected Sidney H. Bierly of San Marino, Executive Secretary and Manager.

Prizes were awarded at the Annual Banquet for golf, bowling, and bridge events.

A PROGRAM OF Service

As you undoubtedly know, the American Plant Food Council and The National Fertilizer Association were consolidated on July 1, 1955 to from the National Plant Food Institute. We are very proud of the accomplishments of our predecessor organizations. It is with the greatest of pleasure that we look forward to the operation of the National Plant Food Institute program which will, I am confident, be of even greater service to the fertilizer industry in the future.

My purpose today is to summarize briefly some of the principal activities of the Isstitute and invite your suggestions for improvement in our program. A basic necessity for the success of an organization such as ours is that it be responsive to the needs and desires of its membership. We look to you for guidance; the more we hear from you the better we like it.

The program of the National Plant Food Institute is organized under two basic divisions: 1. The Government Affairs Division, and 2. The Research and Education Division.

Government Affairs Program

The Government Affairs Division, for which my very capable colleague, Paul T. Truitt, is responsible, is engaged in a number of important activities among which are work with fertilizer control officials, traffic matters, and safety.

Cooperation is extended fertilizer control officials in the several states in accomplishing a better understanding of the state fertilizer laws.

Safety in fertilizer plants is promoted to lower accident rates, further improve working conditions, to cut costs of production and boost output. This project is being conducted largely in cooperation with the Fertilizer Section of the National Safety Council.

Another important activity is that of traffic, guided by the Traffic Committee made up of representatives of member companies. Only broad, non-controversial matters relating to the industry as a whole will be considered in this area.

One of the objectives of the Institute is to promote cordial and good working relations with federal and state governments at all levels and in all matters of practical interest to the industry.

RESEARCH AND EDUCATION PROGRAM

The Research and Education program, for which I am responsible, has as a major purpose the broadening of the fertilizer market on a sound and lasting basis. We believe

that this can best be done by working cooperatively with existing agricultural agencies. We have the highest regard for the land-grant colleges and other agricultural agencies of the nation. We have a long history of close working relationships with them.

Fortunately for our industry, increasing fertilizer use means increasing farm profits and improving farm efficiency. This means, in effect, that our industry's objectives are largely synonymous with those of almost 100,000 state and federal agricultural workers throughout the nation. In many cases our program can be most effective if directed toward the professional agricultural worker, helping him improve farm efficiency. In other cases our program can be more effectively directed toward the farmer himself. Both methods are used in helping our members improve the industry's public relations.

A brief summary of NPFI's Research and Education activities follows:

By RUSSELL COLEMAN, Executive Vice President
National Plant Food Institute,

presented November 7, 1955 at the annual convention
of the California Fertilization Association, San Francisco, California.

Work With Bankers

We feel strongly, as I know you do, that an important factor in the sound expansion of the fertilizer market will be the extent to which bankers become cognizant of the economic importance of fertilizer usage. Bankers are busy people. They simply don't have time to dig out the facts concerning fertilizer usage. We believe that it is the duty of industry and the agricultural agencies to present the bankers with sound, concise and non-technical information on the economics of fertilizer usage.

Many of you are familiar with the excellent brochure published for bankers by the Washington State Bankers Association in cooperation with Washington State College. We contributed substantially to this project. Both your Association and the NPFI are anxious to see a comparable publication here in California. It is my understanding that you have appointed a committee to work on this project. We have informed the California Fertilizer Association that we stand ready to cooperate in the production of a bankers brochure or other similar program and we have earmarked money for this specific purpose.

There are other possible banker service projects which might be adapted to California conditions. For instance, in Illinois we have supplied to banks posters jointly designed by the Illinois Bankers Association, the College of Agriculture and the NPFI. These posters will be displayed in bank lobbies throughout the State of Illinois and will emphasize the importance of fertilizer. Another type project involves furnishing soil fertility advertising mats to banks. As an example, we have just completed arrangements in the State of Colorado where a series of twelve advertising mats will be distributed to Colorado banks by the Colorado Bankers Association. Also, the Colorado Bankers Association is distributing 45,000 copies of an excellent leaflet prepared with our assistance. The leaflet discusses the importance of fertilizer usage.

It is our hope to develop a continuing bankers' program in at least thirty states. No program will be complete that does not include California.

Agronomy Program

1. One objective of this program is to assist present and future state and federal fertilizer research and educational programs and thus stimulate better recommendations for fertilizer usage. This is accomplished through:

a) **Personal visits** and discussions with land-grant college scientists.

b) **Cooperative programs** with the American Society of Agronomy, American Society of Horticultural Science, state plant food educational societies, and other scientific and educational groups.

c) **Graduate fellowships and undergraduate scholarships.** NPFI is establishing fellowships and scholarships in land-grant colleges both to further research work, particularly along the line of fertilizer ecoonmics, and to encourage outstanding students to major in agronomy and related fields.

2. Another objective of our agronomic program is to interpret technical information into easily understood and more useful educational and promotional material and to encourage agricultural workers to do likewise. This is accomplished through the following means:

a) **Promotional leaflets** on fertilizer usage have already been prepared for twenty-three states—seven since July 1, 1955. It is our purpose to produce continuing up to date educational leaflets, based on experiment station recommendations and around which our industry members can build a broader, more effective sales program. We would appreciate knowing whether you believe such a leaflet would be useful in California.

b) Closely related is the preparation of **charts and slides** devoted to economic interpretation of fertilizer usage. These emphasize profit per acre at a lower per unit cost of production. They are based on experimental data. A number of such slides have been prepared for California. They are used in talks and articles by staff members and are furnished to agricultural workers for educational purposes. Professional agricultural writers and workers tell us these charts and slides have exerted a substanital influence in their field.

c) **A Kodachrome slide library** with about one thousand slides showing plant food deficiency symptoms has been assembled. These slides are available for free distribution and for sale at cost to our members and educational institutions. They are widely used in teaching both high school and college students.

d) **Educational books**—three are now in distribution: HUNGER SIGNS IN CROPS (over 100,000 copies sold); THE CARE AND FEEDING OF GARDEN PLANTS: and THE PEANUT BOOK.

e) **Motion Pictures**—Many of you are familiar with the film "California Grows with Fertilizer." It was a joint project of the California Fertilizer Association and our organization. I am told that this film has met with substantial success here in California which of course is gratifying. In addition, there are six different NPFI films available. Five hundred and fifty-five copies of these are circulated directly by this office or are on long-term loan with educational agencies. Here in California nineteen films are on deposit for use in the state. Hundreds of other NPFI films purchased by members and others are also constantly shown. A new NPFI film illus-

trating fertilizer production and entitled "What's In the Bag" is about three-fourths completed. It should be available for distribution in the spring of 1956.

Publication Program

The principal objectives are to inform the membership on current affairs, to present the industry viewpoint to state and federal agricultural workers, farm managers, and others, and to give professional assistance in the production of all NPFI publications. To accomplish this:

1. Weekly **NEWS REPORT** is published for our members every Friday evening.
2. **PLANT FOOD REVIEW** is distributed quarterly to 40,000 readers (mostly agricultural workers.)
3. **Special publications**—examples are "At Your Service" (a pictorial description of NPFI activities), banker brochures, posters, educational pamphlets, etc. Currently, "Our Land and Its Care," "The Soil That Feeds You," and "What is Fertilizer?" are being distributed. Such publications are used by agricultural workers, teachers, students, fertilizer industry representatives, etc.
4. **Miscellaneous promotional material** such as plant-food meters, price-index stickers, etc., are produced and distributed to members at cost.

Information Program

The principal objective is to present the fertilizer story to farmers and the general public through mass media.

1. **News releases** are issued to press, radio, etc.
2. **Farm radio news service** is carried on almost a thousand stations. Four experts from agriculture and industry discuss problems related to the fertilizer industry. This service is carried on fifty-three California and nine Arizona stations.
3. Six **TV film shorts** specifically produced for the TV public are being distributed.
4. Several **direct radio broadcasts** are currently scheduled for staff members, including NBC's Farm and Home Hour.
5. In cooperation with the U. S. Department of Agriculture, four **"package shows"** on the subjects of mixed fertilizer, nitrogen, phosphate, and potash will be prepared and released to 140 TV stations in February 1956.
6. A number of **farm and trade magazine articles** by staff members are being published or planned.
7. Several **awards and contests** are sponsored by the Institute among radio and TV groups, land-grant college editors, farm magazine editors, etc.

Work With Youth Groups

Youth projects are conducted with the Future Farmers of America, National Junior Vegetable Growers Association, and the 4-H Clubs. These projects focus attention on the importance of maintaining, replenishing and increasing the fertility of our soils.

Research and Education Committee

This committee, set up in three divisions, is designed to:

1. Initiate, encourage, and cooperate in studies and programs directed to improving fertilizer utilization and technology.
2. Compile, interpret, and disseminate information from such studies in order to hasten and expand its practical application.

The three major divisions of the committee are: Division of Agronomy and Horticulture, Division of Fertilizer Technology, and Division of Economics and Farm Management.

The committee is made up entirely of member representatives with the exception of one NPFI staff member

Announcing

New York Hanseatic Corporation
has been appointed sole distributor for:

ZEBRA DI-N-CAL
AMMONIUM NITRATE LIMESTONE
20.5% NITROGEN

Manufactured in the Western Zone of Germany—this AMMONIUM NITRATE LIMESTONE has been imported and found wide acceptance during the last several years.

ZEBRA DI-N-CAL is manufactured in pellet form and is packed in 100 lb. paper lined jute bags.

NEW YORK HANSEATIC CORPORATION
120 BROADWAY NEW YORK 5, N. Y.

Affiliated Companies:
CARNEGIE CHEMICAL MFG. CORP. LOS ANGELES, CALIFORNIA
JACK D. SCHWARTZ CO. SAN FRANCISCO, CALIF.

Sales Representative: (East of the Rocky Mountains)
ALEXANDER M. McIVER & SON
P.O. BOX 155
CHARLESTON, S. C.

©1955 NEW YORK HANSEATIC CORP.

who acts as secretary.

Talks, Public Appearances, Etc.

Almost every week NPFI staff members make talks to large or small groups on subjects related to our industry. You on the receiving end can best judge whether this is a service or a disservice. Quite seriously, however, we do feel that it is desirable that the industry-wide viewpoint be presented at many meetings throughout the country. When our staff can be of service in this regard, we are happy to do what we can.

INDIVIDUAL MEMBER SERVICE

Quite apart from the regular programs of the Institute, every member of the Institute staff stands ready to help you in any way possible by providing you with information or performing such services as are within our capacity. Judging from the number of requests we receive, you are finding these services helpful.

SUMMARY

This summary has been presented to you with the hope that you will view it critically in regard to the needs of both agriculture and industry in California. Undoubtedly we are missing some good bets on programs in California. We rely on you for guidance as to where our efforts should be directed. Possibly some of our projects are not of sufficient benefit here. Perhaps some of our activities in other parts of the country could be better adapted to your local needs. Let us hear from you.

Let me assure you that the officers and saff of the National Plant Food Institute fully realize that this organization can only be justificed on the basis of the benefits it brings to industry and agriculture. We think the Institute is pursuing a good program. Our aim is to improve it.

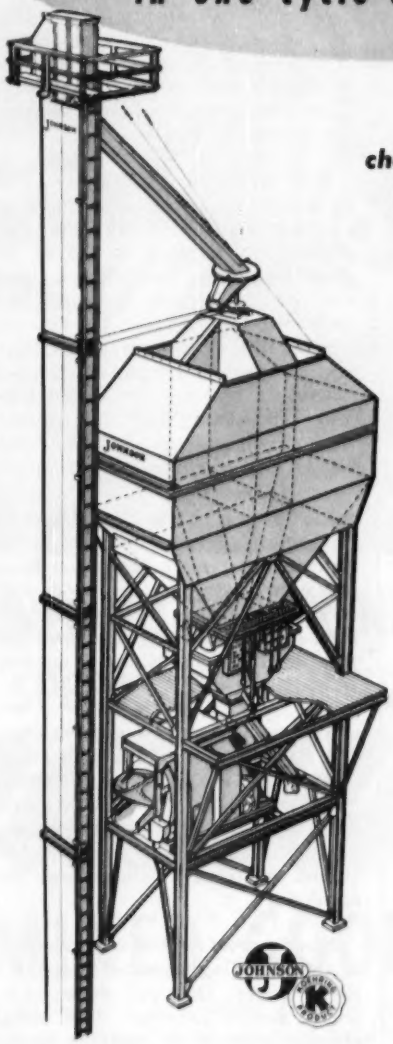
St. Regis Opens Little Rock Office

St. Regis Paper Company has announced the opening of a Multiwall Packaging Division sales office in Little Rock, Arkansas. Bruce C. Kelly, previously sales representative and office manager in Birmingham, will head the new office, located at 38 Barbara Drive.

Syntron Company Subsidiary Of Link-Belt

Link-Belt Company has announced that a plan for exchange of shares between Link-Belt and Syntron Company, of Homer City, Pa., has become effective. Syntron will be operated as a Link-Belt subsidiary.

Batches, blends materials in one cycle of operation



check how this Johnson plant can be adapted to suit your requirements

- Arranged for manual or full automatic control, this Johnson fertilizer blending plant mechanizes all material-handling operations.
- It pulverizes, screens, batches, and blends materials in one continuous-flow operation.
- Enclosed bucket elevator feeds materials to top of the plant at a rate of 1,000 cu. ft. per hour.
- Clod breaker, with short belt conveyor, vibrating screen and collecting hopper can be installed between elevator head-section and overhead storage bin.
- Reject pipes can be added to automatically return oversize materials from the separating screen to elevator for re-sizing.
- Pivoted distributor directs flow of screened material from collecting hopper into storage bin.
- Johnson 100 to 200 cu. yd. Portable Section Bin, shown here, accommodates five materials — has four sections arranged around a central compartment.
- Bin feeds materials into a Johnson multiple-material weigh batcher, equipped with a 5,000-pound dial-head scale. Batcher accurately weighs up to five (or more) fine-grained materials.
- Solution weigh-batcher can be installed on the batcher platform.
- Mixer, for final blending operation can be installed on elevated platform, as shown, or at floor level to reduce plant height.

Owned and operated by leading fertilizer manufacturers, Johnson blending plants offer you a low-cost way to batch and blend materials to exact specifications. Whether you are interested in complete installations, or want to modernize existing facilities, check with us. All types, sizes of plants and auxiliary equipment available. Write today.

Mail to: C. S. JOHNSON CO. CHAMPAIGN, ILL. (Koehring Subsidiary)

☐ Send us more data on Johnson fertilizer blending plants. ☐ Have Johnson distributor call.

NAME ..... TITLE .....

COMPANY ..... DIV. .....

STREET .....

CITY ..... STATE ..... 1547 "CF"

Also interested in: ☐ bulk phosphate plants ☐ aeration systems ☐ screw conveyors ☐ bucket elevators ☐ bins ☐ receiving hoppers ☐ batchers ☐ clamshell buckets

Sackett Builds The Equipment You Need

★ **Continuous Granulating Units**

★ **Plant Modernization Programs**

★ **One Man Batch Weigh Systems**

★ **Mixing and Shipping Equipment**

Aerating Equipment
Automatic Control Equipment
Bagging Units
Belt Conveyors
Bucket Elevators
Centralized Control Systems
Continuous Acidulating Processes
Continuous Ammoniating Systems
Conveyors
Coolers
Crushers
Disintegrators
Dry-Mixing Units
Dust-Arresting Equipment
Fume Scrubbing Systems
Hoppers and Spouts
Materials Handling Equipment
Milling and Screening Units
Multiple Hopper Batching Systems
Oil Fired Dryers
Plant Mechanization Systems
Pneumatically-Operated Gravity Batch Mixers
Pneumatically-Controlled Valves
Pulverizers
Sackett Timken Bearings
Sacking Units
Scales
Screens
Shipping Units
Shuttle Belt Conveying Systems
Tailing Mills
Vacuum Condensing Systems

GET THE RIGHT ANSWER TO YOUR PRODUCTION PROBLEMS *get Sackett*

SACKETT

THE A. J. SACKETT & SONS CO.
1727 S. HIGHLAND AVENUE
BALTIMORE 24, MARYLAND

Soil testing work group of the University of Georgia has made a report covering 142 counties and summarizing 45,765 samples analyzed July 1953-1954. At a glance, it shows where N, P or K are low—a report of real value to those selling fertilizers. It can be had from Dr. H. F. Perkins, Soils Dept., University of Georgia, Athens, or R. L. Carter, Soils Dept. Coastal Plains Experiment Station, Tifton.

* * *

Rice running to a record 143.9 bushels to the acre was produced at the University of Arkansas rice branch, as compared to 57.1 on an unfertilized plot. The prize plot was treated with 266 pounds of urea fertilizer as top dressing on drained soil before the second watering. This was followed by 500 pounds of 8-8-8 liquid injected into the second irrigation. According to Dr. R. L. Beacher, four such treatments averaged 11.8 bushels less than the top figure.

* * *

Rice bricks that will resist atomic fall-out may develop from rice hulls. The resulting brick is lighter than adobe, a better heat insulator—and farmers can turn them out at 5¢ each. LSU researchers developed the idea. Civil Defense is testing against fall-out.

* * *

Atomic collaboration between Central Power Electric, Minnkota Power, Northern States Power and Otter Tail Power—two rural coops, two investor-owned—have given the University of Minnesota $100,000 for studies applying atomic energy to agriculture.

* * *

Atomic proof of the effectiveness of foliar feeding was quoted by Dr. H. B. Tukey, Michigan State, at a recent Senate hearing. "The most efficient method of applying fertilizer to plants that we have yet discovered," he said—the tests suggesting that textbooks will need rewriting.

Corrosives can be handled in fibre glass. Hawaiian Commercial and Sugar has a muriate of potash problem. It eats through steel tanks in a year. Trailer tanks lined with fibre glass does the trick. Polyester resin coating protects pipes and fittings.

* * *

Dispenser that prevents backing up into water supply lets fertilizer flow with lawn and garden watering. Flagler Hydroponics, Miami, owner, Arthur Deatrick, was one of the inventors.

* * *

Farm-City week is an event celebrated in the Santa Clara Valley, California, which gives the farmers a chance to show the city folks how it's done, and to give the city man an appreciation of what the farm means to him.

* * *

RESEARCH RESULTS & REPORTS

Algae sucks nitrogen out of the air. Noting that oriental rice-fields sustain themselves from blue-green algae, Dr. Mary B. Allen, University of California, proved that algae could convert as much as 480 pounds of nitrogen per acre per month.

* * *

Air range feeding over a two year period shows that feeding dry grazing land from the air foreshadows a big increase in beef/acre yield. According to Dr. William Martin, University of California, beef yields were increased as much as 500%.

* * *

Short corn seems to be more efficient that the famed in song and story tall corn of the West, Dr. George N. Hoffer told the Great Lakes reps of Olin Mathieson at a recent meeting. One-ear stalks take up too much room and plant food. With new high-yield hybrids, farmers can grow twice as much corn per acre. Dr. Hoffer is a consultant for Olin Mathieson.

* * *

Two bales of cotton to the acre grew down in Arkansas by irrigation and heavy fertilization on the Fritz Schug Farm near Shugtown. 750 pounds of plant food—flooding, as in a rice field. Cost about $2 more per acre; yield $100 more per acre. Craighead County Agent Woodrow Wilson gets big credit for an assist.

* * *

Manure plus superphosphate insures maximum growth of improved pasture legumes and grasses, according to a recent bulletin from California Fertilizer Association. Manure is low in phosphate, but contains about 10 pounds of nitrogen per ton. Add 25 pounds of superphosphate per ton and you pull up phosphate to the nitrogen level.

* * *

500,000 bales of cotton were lost due to cotton diseases in 1954, according to reports relayed by National Cotton Council.

SACKETT "TUNED TO THE TREND" ENGINEERING SPEEDS PRODUCTION OF

Granular MIXED GOODS

Whether you are planning to build a new plant for the production of granular mixed fertilizers or to convert your existing facilities for granular production, Sackett has exactly what you need in the way of know-how, process equipment and expert engineering and field management.

We are presently building Continuous Granulating Processes in 10, 15, 20, 30 and 40 ton per hour sizes. These capacities are based on a classified finished product.

We invite you to call us in for a consultation.

Superphosphate and mixed goods producers are invited to get our seasoned counsel on their expansion and modernization programs. It is available at no cost.

SACKETT BALTIMORE

America's Foremost Designers and Builders..

SUPERPHOSPHATE PLANTS · FERTILIZER MIXING PLANTS

RELATED PRODUCTION EQUIPMENT

THE A. J. SACKETT & SONS CO.,
1727 S. HIGHLAND AVENUE, BALTIMORE 24, MD.

Architects and Manufacturing Engineers to the Fertilizer Industry since 1891

Safety IN THE MIXING OF FERTILIZERS with INSECTICIDES

By Robert P. Henry, Agricultural Department, Willson Products, Inc.

Safety problems connected with fertilizer-pesticide mixtures are steadily becoming more complex. Each new formulation compounds the issue and complicates the solution. And these problems are still very much in their ascendancy. Even as new materials and mixtures are developed, the demand for yet more effective ones is heard. It stands to reason that for greater effectiveness, the pesticides involved must of necessity be more potent and more toxic. Naturally, the industry will be expected to produce these new mixtures despite the hazards involved. Therefore, our problem is not one that can be solved for all time, but rather one that we must learn to live with and grow with over the years to come.

To meet this complex problem successfully we cannot afford to overlook any detail, however small. Therefore, let us take stock of the situation and determine the direction our planning should take. The first things to be considered are those practices and precautions we already have in effect. Many of these measures apply equally well to the safe production of insecticide-fertilizer mixtures as they do to the manufacture of standard ferilizers. I refer here, of course, to the normal problems of materials handling, safe conduct around moving machinery, good housekeeping, prevention of fire and electrical hazards, safe performance of maintenance work, and general health and morale conditions. These are routine factors in every well regulated safety program but none-the-less they must be reviewed and reevaluated as we consider our overall plan for the safe handling of fertilizer-pesticide mixtures. And as you make this mental inventory I feel sure you will come to the same conclusion I reached in preparing this presentation. These problems being common to both operations require a thorough soul-searching to assure ourselves we are doing not only everything necessary but everything possible to assure operation without incident.

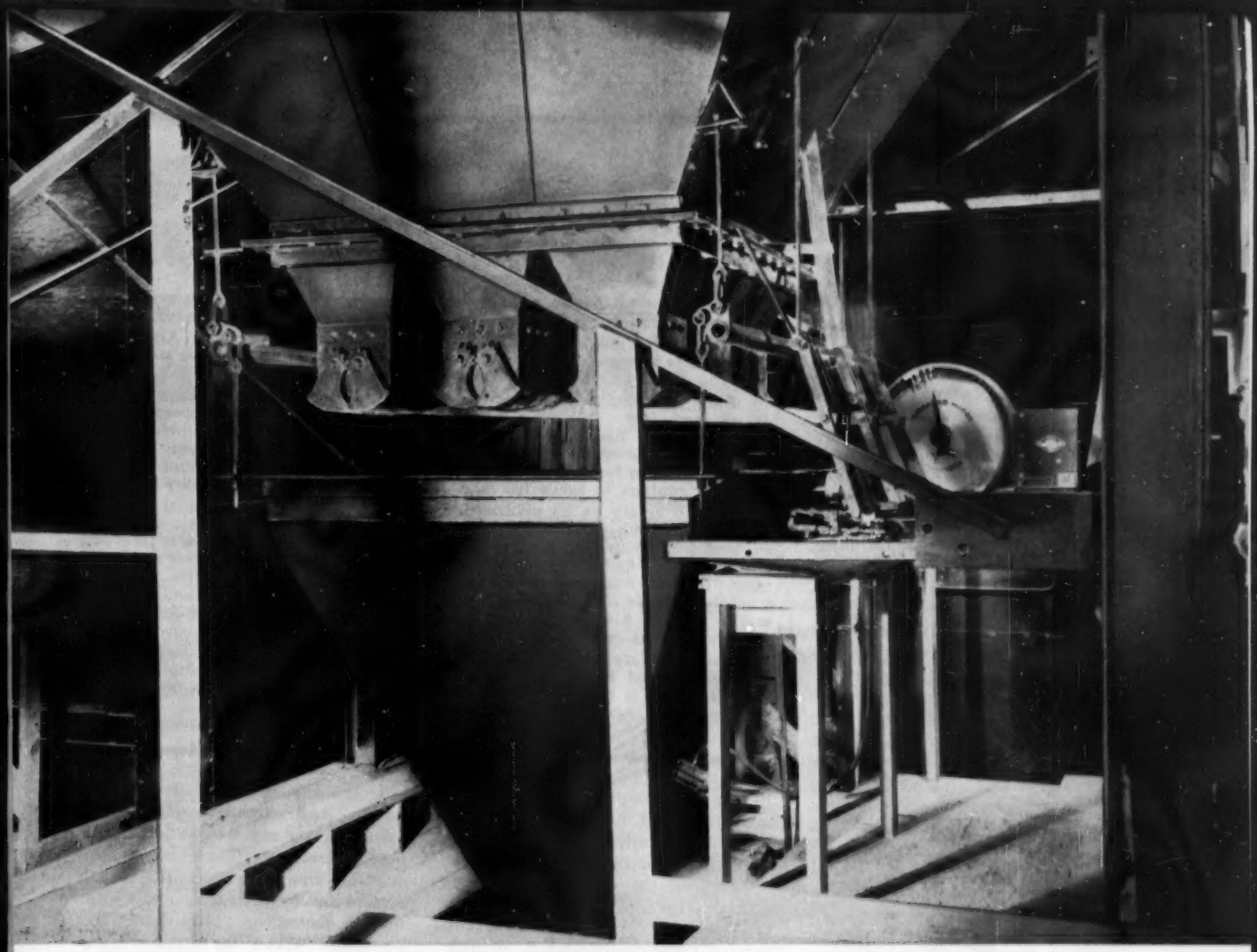
The principal safety problem related specifically to insecticide-fertilizer mixtures is that of personnel protection. The toxic materials involved affect humans much the same as they do the insects they are designed to destroy. If they are breathed, swallowed, or absorbed through the skin in sufficent quantity, they are almost immediately fatal. Fortunately, the odds against a worker encountering a concentration sufficient to cause quick fatality are long and casualties of this nature are very rare. But smaller doses, repeated daily, have a cumulative effect on the system that can cause death or very serious illness if not discovered and remedied in time. Such cases are far more common.

Unfortunately, accurate statistics to form a conclusive picture of the casualty record for pesticides is hard to come by. However, the State of California has for some years done a very creditable job of reporting on this topic and the following facts are excerpted from their report, "Agricultural Chemicals Causing Occupational Disease—California 1954". It is my opinion that this account can be taken as a pretty fair indication of the national situation. The first thing in this report that impressed me was this statement of definition, "Agricultural chemicals are those organic and inorganic compounds prepared for their influence on the growth or destruction of plant and animal life when used or prepared for use in agriculture. Agricultural includes horticulture and warehouses dealing with products used primarily for agricultural purposes."

That is a very comprehensive definition which illustrates excellently the extent of our problem with pesticide-fertilizer mixtures. Later we shall review this scope of responsibility but for now let us continue with the report. In 1954 a total of 391 cases of occupational disease caused by the use of agricultural chemicals were reported in the state of California. Of these 47% or 184 cases were lost time accidents, 40% or 156 cases lost no time from work, and in the remaining 13% or 51 cases the query on lost time was not answered. 53% of the cases were skin diseases, the remaining 47% were systemic poisoning. If we accept these figures as reasonably typical their significance is obvious, and they can serve as a definite guide to our thinking and planning.

The next point for consideration, as I see it, is a review of the toxic pesticides being used in fertilizer-pesticide mixtures. Here we are fortunate in having the current information presented in Rodney C. Berry's excellent report covering our own 48 states and Canada, Puerto Rico, and Hawaii as well. A quick analysis shows that 75% of the types of pesticides cited in this report fall within the definitely toxic classification. Carrying our analysis further we find that 88.7% of the mixtures produced incorporate these dangerous materials. This percentage is based on frequency of appearance in the Berry report and is not intended to indicate proportion by volume. To the best of my knowledge, production figures that would give us percentage by volume have not been compiled. However, the information available does give us a fair picture of this phase of the situation.

With this statistical background to guide us, I believe we are ready to look into the required preventive measures we must take to safeguard our personnel. First to be considered in this respect are the steps we can



FERTILIZER PLANTS and EQUIPMENT

Whether you are interested in building a new fertilizer plant, or modernizing your present facilities, you will profit by consulting DAVIDSON-KENNEDY COMPANY. A competent staff with broad, practical experience stands ready to assist you with your particular problem, or to offer complete turnkey service on a new plant. DAVIDSON-KENNEDY engineers will supervise installation and upon completion will train personnel in the operation of D-K equipment. Call DAVIDSON-KENNEDY COMPANY and discuss your plans. You will profit from it.

COMPLETE FERTILIZER PLANTS / FERTILIZER MIXING PLANTS

Acid Plants / Acidulating Plants / Mixing Units / Granulating Plants / Batching Systems (in line and cluster hoppers) / Continuous Ammoniating Plants

DAVIDSON-KENNEDY CO.

1090 Jefferson Street, N.W. Atlanta, Georgia, U. S. A.

take to reduce the atmospheric hazards to a minimum. Proper ventilation of the area is a must. This can be accomplished to some degree by natural airflow but a mechanical dust collecting system is the best, and sometimes the only satisfactory method. High ceilings and uncrowded conditions are helpful but dust collecting equipment at critical points is far more efficient.

Next comes the matter of proper clothing properly worn to avoid poisoning by absorption through the skin. Only where workers are directly handling highly concentrated pesticides is special safety clothing required. On operations involving high percentage materials of this nature, rubberized clothing including gloves should be furnished and the wearing of it enforced. Ordinarily, such equipment is required only for those workers who are in direct contact with the insecticide during some phase of the process. Workers on operations around the mixers or the bagging equipment will be protected adequately by ordinary work clothes. These, however, should be of fairly heavy, close-knit material. Long sleeve shirts fastened at both neck and cuff are a must. Also, the head and neck should be protected, preferably by a hat or cap equipped with a hood that covers the back of the neck—something like the kepi worn by the Foreign Legion. A very vulnerable point of exposure is the eyes. These should be protected by dust goggles, preferably the indirectly ventilated type which permit air to circulate within the goggle to prevent fogging but filter out the toxic dust. And for workers handling or in close contact with the mixture, gloves—preferably of natural rubber —are a necessity. In short, every possible portion of the body should be protected from contact with the toxic ingredients of the mixture.

Nearly equal in importance to keeping personnel as free as possible from body contamination is providing means for them to remove the traces of poison that inevitably will penetrate their protective clothing. Adequate shower facilities are the obvious answer to this, and an after-work clean-up should be routine.

By far the most serious problem to be considered in the matter of personnel safety is that of protecting the nose and mouth. Obviously, these are the most vulnerable points of entry for poison to get into the human system. And when admitted through these channels the toxic action is naturally swifter and more damaging than in the case of skin absorption. Even with efficient dust collecting equipment in usage, the atmosphere will most likely remain sufficiently contaminated to require individual respiratory protection for workers in the area. Under average circumstances, the recommended type of protection is a dual cup respirator equipped with organic vapor cartridges and efficient dust, fume and mist pre-filters. However, extreme concentrations require the use of a full face gas mask with suitable canister for the specific contaminant.

Selection of the proper devices for satisfactory respiratory protection is a matter for a qualified industrial hygienist or safety consultant. Such counsel is available to you from the manufacturers of this equipment; your own suppliers of safety equipment will be happy to make a survey of your plant and recommend proper measures.

Another hazard incident to the nose and mouth is that of eating or smoking in the contaminated area or before thoroughly cleansing the hands and face after exposure. Rules regarding this must be laid down and enforced strictly.

In summing up this analysis of the personnel protective problems connected with fertilizer-pesticide mixtures, two important factors remain to be considered. First, even with the best protection, workers should not be exposed to the toxic materials for any great length of time. Continued exposure increases considerably the chance of serious contamination. And secondly, regular medical check-ups are a must for all exposed personnel. Toxic insecticides manifest their presence in the human system by definite signs and symptoms a doctor can easily detect and recognize. According to the severity of these symptoms he can readily determine if the worker is fit to continue on the operation or whether he should be transferred to another job until his system has recuperated from the poisoning. This can be determined, of course, only through re-examination by the doctor.

Thus far we have considered only our responsibilities to our employees and ourselves. Now we must look at our responsibility to the ultimate user of the mixture. This responsibility, of course, mainly concerns labeling and since this is covered by State and Federal regulations I mention it only as an important factor to be considered. Over and above the legal requirements we must make sure that our labeling contains clear, complete, emphatic warning to the user that the mixture contains toxic materials and advise him what precautions must be taken in the storage and use of it.

As I stated at the start, the safety problems connected with fertilizer-pesticide mixtures are many and complex. They can be met and controlled, however, by a well integrated, carefully supervised program.

A Little Safety Is A Dangerous Thing

You can't leave safety up to George. Somebody once wrote that we seldom learn from somebody else's experience and only too late from our own. That's true in safety. Everybody's for safety, the unassailable virtue. Nobody's against it. But it's always something for George to do.

Hazards are normal in an industrial plant. Yet they can be avoided or controlled through education, constant instruction and alert supervision.

Safety is as much a commodity that can be sold as fertilizer. And supervision plays a large part in the selling program. After all, it is the supervisor who has direct and daily contact with employees.

Such a sales program revolves around building an attitude or creating a desire for safety. You can't get a farmer to buy 12-12-12 just because you want to sell it. You've got to prove that it is of use to him, that he'll benefit from its use. In other words, it's easier to get him to do what you want for his reasons than for your reasons. The supervisor is in the best spot, through his daily contact, to know his men, what they'll buy and how they'll buy it.

Selling safety as an attitude does work. A recent instance of a safety attitude at work happened at one of the Division's plants. An employee advised another to use his safety goggles on the job. The advice was followed and the man's sight was saved in the mishap that occurred a few moments later. Eugene Williams, urea synthesis operator, gave that advice. His was a safety attitude at work. The kind of attitude that can be sold and that will work. It's the kind of attitude that an employee needs and should accept as a part of his responsibility.

Selling safety is a constant job that goes on 24 hours a day. But first the supervisor must know his problem. Then keep doing something about it. A little safety is a dangerous thing. It can easily close our eyes to the constant need for more.

From Nitrogen Division Life, August, 1955, issue

your eye tells you why

International's New Triple Superphosphate assures more

complete ammoniation

ONE look shows you why International's new Triple Superphosphate offers such a big advantage in ammoniation. Its improved fineness of texture; uniform, dust-free particles; and correct chemical structure assure maximum ammoniation in minimum time — help cut your manufacturing costs. International's new Triple Super is made by an improved process from high quality rock. Result: a high-analysis product (46% A.P.A. or better). Special conditioning before shipment helps prevent setting up en route. This, plus improved particle size, means less grinding before mixing, more economical handling, better texture in your finished products and high product performance. International's new Triple Super is ready for immediate delivery to your plant. Write or wire the Phosphate Chemicals Division for samples and quotations.

INTERNATIONAL MINERALS & CHEMICAL CORPORATION

General Offices: 20 North Wacker Drive, Chicago 6

ARKANSAS

National Farmers Union is still keeping Arkansas on tenter-hooks about the multimillion dollar fertilizer plant. **Resources Corporation,** the subsidiary which would build the plant keeps assuring the City Fathers of Helena that they will be given every consideration, and the local newspapers keep publishing optomistic stories about it. This has been going on since last August, as our readers know.

CALIFORNIA

Wilson & Geo. Meyer & Co., of San Francisco, Pacific Coast importers and distributors of agricultural and industrial chemicals, has pioneered a service for West Coast agriculturists and at the same time developed a two-way trade with Norway that is rapidly expanding.

Several years ago the firm initiated, as an experiment, a program to divert incoming cargoes of Norwegian calcium nitrate and urea to some of the smaller, less congested Pacific Coast ports, situated close to the great agricultural areas, thus enabling farmers to take shipside deliveries of these two important Norwegian fertilizers.

First tried in San Diego in 1952, the experiment was so successful that the firm immediately explored the possibilities in other agricultural areas served by nearby ports.

The firm now makes regular deliveries via the **Fred Olsen Line** fleet of fast motorships to the inland Port of Stockton and to Port Hueneme, Ventura County, and Oakland, and to Vancouver, Wash., as well as Portland and Seattle. Such deliveries are reported by the company to be exceptionally successful, with cargoes sold out long before their arrival.

A recent development was establishment of a warehouse stock of the nitrogens at Port Hueneme, enabling citrus, bean and truck crop growers of the area to obtain supplies on short notice.

On their return trip to Norway, the Olsen Line vessels are crammed with West Coast agricultural products — principally oranges, lemons, prunes and raisins—all in great demand in Norway. Frequently the fruit is purchased from the same farmers who bought the fertilizers.

Thus American dollars earned through the sale of Norwegian calcium nitrate to farmers pay for substantial purchases of West Coast produce for shipment to Norway, an outstanding example of free enterprise between Norwegian and American businessmen without government participation or government aid on either the part of Norway or the United States.

The fertilizers imported by the Meyer firm are manufactured by **Norsk Hydro,** one of the world's largest hydroelectric enterprises which made a phenomenal comeback after being practically destroyed during World War II.

The 105-year-old Meyer firm, which in addition to its headquarters in San Francisco, has district offices in Los Angeles, Fresno, Portland, Seattle, Salt Lake City, Denver and Phoenix, is sole Pacific Coast distributor for Norsk Hydro fertilizers.

* * *

West End Chemical officials are giving serious thought to moving their present quarry operations to Inyo County, where they have found lime rock deposits in the Argus Range. If they do, they will install a rotary lime kiln.

FLORIDA

International Minerals & Chemicals have established a technical department for their Bonnie phosphate plant near Bartow, it has been announced by Howard F. Roderick, vice-president phosphate chemicals.

Raymond E. Tuttle has been made manager of the new department, which will consist of two present groups, the process engineering group and the chemical control laboratory. Mr. Tuttle has been chief process engineer at Bonnie for the past year and is a chemical engineering graduate of Cornell university. In his new capacity he will report directly to William Bellano, manager of Bonnie plant operations.

The responsibilities of the Technical Department will consist of process and quality control, new developments and liaison between the Engineering and Research Divisions of the corporation relative to process problems. This group also will give technical service to the Production and Engineering Departments as required, Mr. Roderick said.

* * *

Escambia Bay Chemical will start production about the 15th of this month in its new $25,000,000 plant in Santa Rosa County, using natural gas as the raw material. They will produce anhydrous ammonia, ammonium nitrate, nitric acid and other components for mixed fertilizers.

But even before they have produced the first goods, they are planning facility expansion, which will broaden their base into plastics.

Ashcraft-Wilkinson, Atlanta, have, as our readers know, been named sales agent for their fertilizer products.

* * *

Howard Fertilizer, Inverness, has just harvested four carloads of watermelons, a late crop grown as an experiment on eight acres of land which was cleared only two years ago. A crop of oats and peanuts prepared the land, and the watermelons were planted in mid-August, cultivated only twice . . . and in size and quality are comparable to melons grown in the normal season. There being, however, no Northern demand for watermelons, after the cold weather sets in, they were marketed in Florida.

* * *

American Cyanamid have been authorized to prospect the site of a burned out school, right on the edge of their present prospected area, and to submit a proposition to mine it, to the Combee School Board.

GEORGIA

Southern Nitrogen will finance their $14,000,000 Savannah plant by way of three blocks of securities:

Mutual Life Insurance Co. of New York will buy in instalments $8 million of 4½% first mortgage bonds, due April 1, 1971. Other portions are $7,500,000 of 6% subordinated sinking fund debentures, due May 1, 1971, and 600,000 shares of common stock combined into units, and an additional 400,000 shares of common stock. **First Boston Corp.** acted as financial advisor.

TENNESSEE CORPORATION

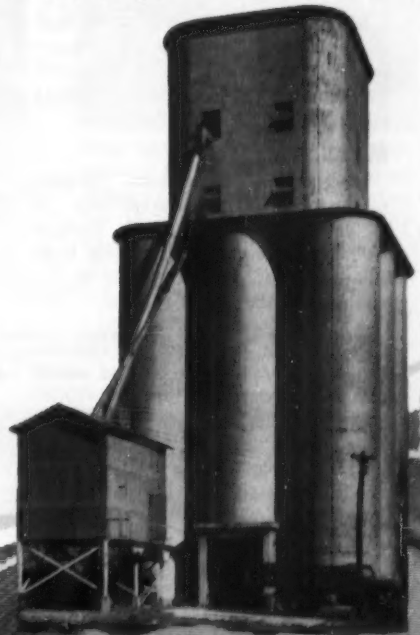
TRIPLE SUPER-PHOSPHATE

1. RUN-OF-PILE FOR MAXIMUM AMMONIATION
2. GRANULAR FOR DIRECT APPLICATION
3. PROMPT SERVICE TO MEET EVERY REQUIREMENT

There is no better source for quality and dependability in Triple Superphosphate than U. S. Phosphoric Products. For nearly 30 years, this company has been producing superior phosphate fertilizers for maximum satisfaction and efficiency. Call upon your Bradley & Baker sales representative today to help you plan your shipments to your greatest advantage.

U.S. PHOSPHORIC PRODUCTS
Division TENNESSEE CORPORATION
Tampa, Florida

Sales agents: **BRADLEY & BAKER**
155 EAST 44th STREET • NEW YORK 17, N. Y.
District Sales Offices: ATLANTA • INDIANAPOLIS
ST. LOUIS • NORFOLK • HOUSTON



ILLINOIS

U. S. Industrial Chemicals' ammonia plant at Tuscola has just finished installation of a new **Girdler** reforming unit to produce hydrogen from natural gas, supplementing the hydrogen they have been getting from their neighbor, **National Petro-Chemicals,** and permit full capacity operation of the 150 daily ton plant.

* * *

Crop Service Co. has virtually completed its liquid fertilizer mixing plant at Rising. Manager H. J. Schultz says it will turn out 100 daily tons of mixed liquid goods.

IOWA

Virginia-Carolina's new plant at Estherville is making good progress and they expect to be ready by early Spring to serve with both bag and bulk fertilizers the area of northwestern Iowa, southwestern Minnesota and eastern South Dakota.

* * *

Geigy's Des Moines pesticide plant is being taken over by **Diamond Black Leaf.** The plant was built last year, and cost $500,000. Diamond Black Leaf was formed last February to absorb to former V-C Black Leaf operation.

* * *

H. D. Campbell are about ready to operate from their Strawberry Point plant, the first liquid fertilizer operation in that area. **William Cannon** is local manager for the concern, which also has a plant at Rochelle.

* * *

E. I. Sargent Quarries is the new name of the Des Moines lime operation, formerly **Sargent Bros.** The change was made because A. E. and W. I. Sargent, brothers, have withdrawn from the firm.

MARYLAND

Miller Chemical and Fertilizer, Baltimore, has announced a scholarship at the University of Maryland for a needy student wishing to study agriculture.

MISSOURI

Deep Root Fertilizers, Olathe, seems to be an editorial jinx. In October we placed them in Kansas. In November we spelled their town Iolanthe—doubtless in honor of the opening of the opera season!

* * *

Semo Liquid Fertilizer Co., Charleston, will be ready this coming season to supply complete liquid fertilizer to the Missouri Delta. **Dee C. Jennings,** general manager, has returned to his native city to supervise installation of modern mixing equipment.

MONTANA

Montana Sulphur and Chemical is to build at Billings a sulphur plant which should be ready early in the new year.

NEW JERSEY

The Pennsylvania Salt Manufacturing Company has started construction of a plant for the production of granular fertilizers, president **William P. Drake** has announced. "The addition of this facility reflects Pennsalt's growing interest in the agricultural chemicals and commercial fertilizer industries," Mr. Drake stated, "and the inclusion of these new products in our I. P. Thomas fertilizer line will result in a substantial expansion of our domestic distribution. Through Pennsalt International Corp., they are also expected to find extensive markets abroad."

Pennsalt acquired the 83-year old **I. P. Thomas Company** a year ago. Under the continuing direction of general manager **R. R. Hull,** it has become the sixth operating division of the company. Its distribution facilities cover much of the eastern seaboard.

The new production unit will adjoin Pennsalt's plant and central warehouses at Mantua Point on the Delaware River in Paulsboro. Principal products of the present plant are conventional commercial and specialty fertilizers, triple superphosphates, prosphoric and sulfuric acids, blended insecticides and "Hy-Phos," a recently developed water conditioning chemical.

The new plant was designed by Pennsalt's central engineering staff and is being built by the **Unkefer Brothers Construction Company** of Philadelphia. When completed early in January, 1956, it will be the first plant in that area to produce a full line of granular fertilizers to meet all agronomic requirements.

Other Pennsalt agricultural chemicals include insecticides, fungicides, defoliants, disiccants, and weed killers. These are produced in Pennsalt plants at Tacoma, Wash., Portland, Ore.; Bryan, Tex.; and Montgomery, Ala.

* * *

Dixon Chemical and Research is selling $2,250,000 of first mortgage bonds to 225,000 shares of common, the proceeds from which will be used to build a new sulphuric plant at Newark.

NITROGEN DIVISION PLAN

Fertilizer Grows Farm Profits

A new public relations advertising program designed to tell farmers how to make money through the adequate use of fertilizer despite the current farm cost-price squeeze has been announced by Nitrogen Division, Allied Chemical & Dye Corporation.

The theme of the program, "Fertilizer Grows Farm Profits," is based on studies by government and industry groups. These studies show that double or tripple crop yields can be obtained by using more fertilizer and that farmers can thereby get two or three times as much income from the same amount of land, or from lesser acreages in some instances. Increased yields and income enable the farmer to carry fixed costs despite lower crop prices, acreage restrictions and increased cost of things he has to buy.

The program will consist of a series of full-page, two-color advertisements appearing throughout 1956 in leading farm publications reaching more than 3½ million farmers each month. Direct mailing will be made to members of the fertilizer industry, county agricultural agents, farm bankers, and others particularly interested in farm prosperity.

None of the advertisements will mention any fertilizer brand, but will promote the use of all types of mixed fertilizers made by some 1500 manufacturers. Although this is the first time such a program has been conducted on behalf of the whole plant food industry, the Nitrogen Division has for the past two years been sponsoring educational work on fertilizer economics with farm youth groups, such as 4-H and Future Farmers of America, agricultural educators and scientists, and other agricultural leaders.

Nitrogen Division is the major supplier of nitrogen products to the fertilizer industry, having originated the nitrogen solutions with which the majority of all mixed fertilizers are made. Its nitrogen plants are located at Hopewell, Virginia; South Point, Ohio; and Omaha, Nebraska.

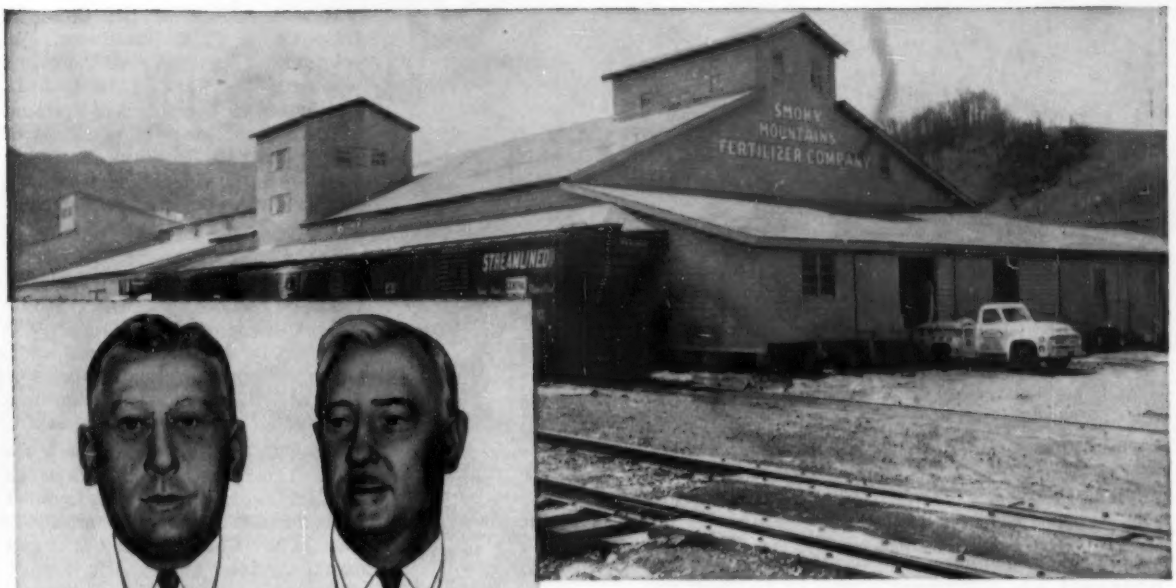
NEW YORK

The merger of **Consolidated Chemical Industries** into **Stauffer Chemical Company** was approved by stockholders of both companies at special meetings held Nov. 14 in San Francisco, California.

At the Stauffer meeting 2,204,499 shares, or 93 per cent of total shares outstanding, voted in favor of the merger, with 390 shares voting no. At the Consolidated meeting, 223,013 shares of the Class A stock, or 83 per cent of the total shares of such stock outstanding, voted in favor of the merger, with 2,985 shares voting no. After the merger the total assets of Stauffer Chemical Company, the surviving Corporation are $125,000,000.

* * *

Garden Research Laboratories is the name of the merger of **Nutritional Concentrates,** Ohio with **Garden**



C. G. Thompson (left) is president and J. W. (Jack) Rutland is vice-president of this fast-growing company.

The only fertilizer plant in the famous vacation lands of the Great Smoky Mountains, the Smoky Mountains Fertilizer Company is located at Hazelwood, N. C. The company was started in 1950, and serves a radius of 100 miles with Blue Ridge Brand Plant Foods.

Smoky Mountains Fertilizer Company ... Another Spensol User

Here is some of the modern equipment used by Spencer to produce SPENSOL Nitrogen Solutions for some of America's leading fertilizer mixers.

On time deliveries of SPENSOL solutions have helped to build Spencer's reputation for dependable service to mixers throughout the country.

New kind of solution injector, giving better ammoniation of mixed fertilizer, was invented by H. B. Davis of Spencer Chemical Company staff.

SPENCER

SPENCER CHEMICAL COMPANY, Dwight Bldg., Kansas City 5, Mo. District Sales Offices: Atlanta, Ga.; Chicago, Ill.; Memphis, Tenn.; Works: Pittsburg, Kans.; Henderson, Ky.; Chicago, Ill.; Vicksburg, Miss.; Orange, Texas.

America's Growing Name in Chemicals

Here are six bank farm representatives who attended a seminar in Kansas City last month. The three-day event was the second conducted by Spencer Chemical Company in an effort to call attention to and learn more about the work of farm representatives. Six bankers from six states were represented. One day of the seminar was taken up by a tour of the company's Jayhawk Works near Pittsburg, Kans. The group is shown here examining some corn which was being picked near the works. From left to right in the picture are: James M. Smith, Corinth, Miss.; James P. Turner, Lafayette, Ind.; Moscow Wright, Columbia, Tenn.; Dr. R. L. Baiser, a Spencer agronomist; A. J. Dinsdale, Maryville, Mo.; R. P. Rinne, Fairbury, Neb. and Harris Sorenson, Wahpeton, N. D.

Research Laboratories of New York, where executive offices will remain.

Chairman of the board of the new company is **J. R. Pussell, Jr.,** director and executive vice president of the **Brookline Trust Co.,** Pittsburgh. **C. H. Snyder,** president of **Sunnyhill Coal Co.,** New Lexington, Ohio, was elected president.

Mr. Snyder said: "Some of my associates and I want to expand in the garden supply field. The garden supply business already exceeds $3 billion in annual volume and should soon exceed the combined volume of both the drug and cosmetic industries."

There will be two principal divisions of the company. A packaged products division will serve the "do-it-yourself" market. A separate division will use the company's larger equipment and provide automatic fertilizing, weed control, crabgrass control, hydramatic seeding, and other automatic services to home owners. A third division will handle farm sales of equipment, fertilizers and other chemicals. All equipment will be manufactured at New Lexington.

NORTH CAROLINA

International Mineral and Chemical is planning a $94,200 addition to its Winston-Salem mixing plant.

OHIO

Green Belt Chemical Co., Paris, are pretty proud of their progress. On May 15 they dug the first shovel of dirt and exactly four months later, to the day, they shipped their first load of fertilizer, writes president **M. K. "Bud" Miller.** He enclosed a copy of the "Green Belt Journal" which helped to introduce the new plant to his area. Here are some of the things it says: Located for easy access, with good roads to all four points of the compass, and a railroad siding right to the plant doors. "Look for the office with the green stripes on Route 36" (this is an excellent idea to help growers find the plant easily).

The plant cost around $150,000; is 200 by 130 feet, featuring an overhead conveyor system, a special loading dock for bulk sales, and a capacity of 15,000 annual tons. **Phil Pettett,** with 21 years experience, is plant manager.

* * *

Farm Bureau Cooperative Association has opened what they say is the "most modern fertilizer plant in the nation—and perhaps in the world," with its **Sackett** granulating equipment designed to turn out 70,000 annual tons in a two-shift operation.

Vice president Wayne H. Shidaker points out that only 15 will be employed due to the almost completely automatic operation. The co-op's officials are considering remodeling their other five plants — Alliance, Dayton, Glendale, Marietta and Maumee—to granulation.

COLORADO

Umbaugh Chemical has arranged a trip to **Brookside Research Laboratories** at New Knoxville, Ohio, so community leaders in their area can see what modern fertilizer developments will be incorporated in their new Walsenburg plant, opening next Spring.

OREGON

Portland Seed Company, Portland, has bought control of **Chas. H. Lilly Co.,** Seattle.

New president of the Chas. H. Lilly Co. is **F. C. Trullinger,** also president of Portland Seed Company, who succeeds **C. F. Larsen. J. D. Trullinger,** vice president of Portland Seed, has become vice president of Lilly's and **E. E. White,** formerly Lilly's vice president and treasurer, now holds the position of secretary-treasurer in the reorganized firm.

The two pioneer Pacific Northwest companies, covering basically the same market area, will continue to operate separately and each will maintain its own identity and staff. "Personnel, products and policies of the Chas. H. Lilly Co. will continue unchanged," its new president said.

The combined business experience of the two firms totals 133 years, as Portland Seed Company was founded in 1892, just seven years after the start of the Chas. H. Lilly Co., and quickly gained an important position as a large distributor of agricultural, seed and gardening supplies. The Chas H. Lilly Co., as well as acting as a distributor for such supplies, specializes in seed culture and the manufacture of fertilizers for Pacific Northwest soils and climatic conditions. Lilly's has long been a leader in agricultural research and test-plot development of new products.

In addition to its Seattle headquarters, the Chas. H. Lilly Co. has plants and offices in Ellensburg, Mount Vernon, Yakima, Spokane, Albany and Portland. Portland Seed Company, with headquarters in Portland, operates a Seattle branch, and owns the Inland Seed Company in Spokane, a separate corporation.

TENNESSEE

Perry County Phosphate Corp., Linden, has been bought by **Cecil** and **Winifred Parish,** including all equipment and mining leases on some 37,000 acres of land. Some increase is planned in the 75 people now employed.

UTAH

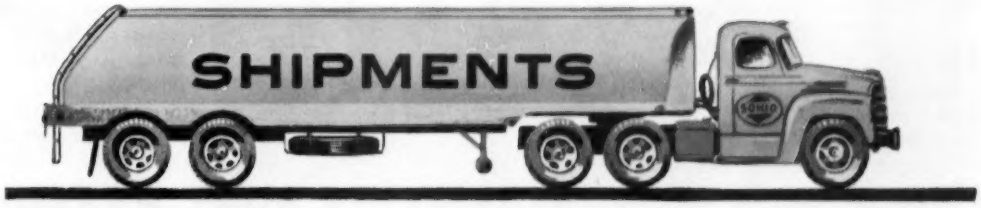
Pennsalt and **Hooker** have teamed up to form **Chemical Salt Production Co.** which will operate on a 12,000 acre site near Salt Lake City, harvesting 120,000 annual tons of salt to begin with, but looking forward to 1,000,000 annual tons for the future. They expect to be in operation April 1.

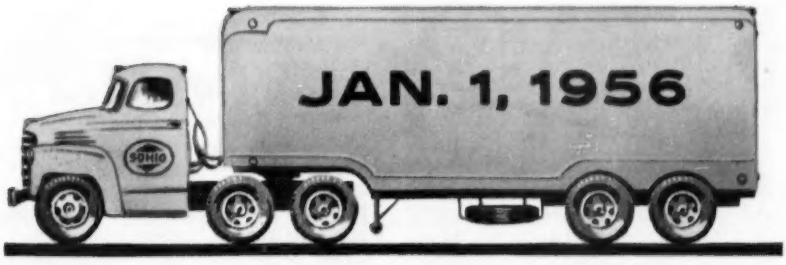
VIRGINIA

Charles W. Priddy, Money Point, have started construction of a granulating unit adjacent to their present plant. It is their first major ex-

Your NEW SOURCE for Nitrogen Chemicals

Sohio Chemical Company





Our fleet of new aluminum or stainless steel tank cars and trucks will be ready to serve you starting January 1st, 1956.

Centrally located in the agricultural mid-west, Sohio Chemical Company offers you fast, low cost delivery. Our large storage facilities and extensive selection of nitrogen solutions can supply your most complex requirements.

AMMONIATING SOLUTIONS	UREA (PRILLED)
ANHYDROUS AMMONIA	NITRIC ACID
AQUEOUS AMMONIA	UREA-AMMONIA SOLUTIONS

SOHIO

SOHIO CHEMICAL COMPANY

LIMA, OHIO

The recently completed Research and Development Center of the Smith-Douglass Company, located off the Military Highway adjacent to the company's Norfolk plant. The circular building is a bench laboratory for very small scale pilot plants. To the left are the general offices, containing library, conference rooms and engineering and drafting offices. The center is considered one of the most modern in the plant food industry.

pansion since World War II. Priddy is the oldest plant in that area, founded in 1897, and **S. Y. Priddy** is president.

The new plant, a 20 hourly ton unit, was designed by **T. David Fitz Gibbon.** Norfolk, with engineering by **Industrial Engineering Company. E. T. Gresham** is general contractor.

* * *

Royster's plant at Lynchburg was recently threatened by fire in the vicinity, but firemen stopped the flames in time.

CANADA

Canadian Industries' 200 daily ton ammonia plant at Millhaven, Ontario, is to be built by **Girdler of Canada.** It will use the **Texaco** partial oxidation process, using residual fuel oil as raw material for gas synthesis. This is similar to the plant being built by Girdler for **Northern Chemical Industries** in Maine.

* * *

Canadian Gulf Oil have begun construction on what is to be Canada's largest sulphur plant, capable of 225 daily tons, at its Pincher Creek gas field, in Alberta. **Northwest Nitro Chemicals** has already contracted for a substantial portion of product, to be delivered in the form of elemental sulphur in a liquid state, which they will use in processing high analysis N and K fertilizers at their new Medicine Hat plant (See CF Sept.). Gulf expects to complete the plant by September.

* * *

Agricultural Chemicals Limited announces its plans to construct a modern $125,000 fertilizer factory at Hyde Park (London), Ontario. The new plant is expected to be in operation by July or August of 1956.

Plants are now in operation at Port Hope, Ont., and Fort Chambly, Que. Home office is at Port Hope. Agricultural Chemicals Limited supplies a complete line of fertilizers, and provides soil testing service.

ENGLAND

Shell Chemical and **Fisons Ltd.** have agreed to build two fertilizer plants on the Thames Estuary, London at a combined cost of $30,000,000. The Shell plant will produce ammonia and nitric acid, turning out 75,000 annual tons by 1958. The Fisons plant will use 60,000 tons of this ammonia, and the balance will be used by Shell, itself, for ammonium-nitrate-limestone fertilizers, anhydrous ammonia and nitric.

INDIA

Stanvac Bombay Refinery and the Indian Government are considering a $21,000,000 fertilizer plant on Trombay Island, which would draw on the waste of the adjacent **Burmah-Shell** refinery, if present negotiations are completed.

JORDAN

Jordan is planning a $13,000,000 potash operation in the Dead Sea, of which the government will subscribe $2,000,000, the remainder to be raised by stock offered in the other Arab states—Egypt, Iraq, Saudi Arabia, Lebanon and Syria.

KOREA

Chungju's $19,000,000 urea fertilizer plant was launched with ground-breaking ceremonies October 22, and completion is scheduled within 30 months. The plant should produce 85,000 annual tons of urea.

MEXICO

Mexican Gulf Sulphur last month tuned up its production to 500 daily tons. Located on the Isthmus of Tehauntepec, the concern started sulphur production in March of last year. The plant uses the Frasch process.

ALBEMARLE BUYS RAYMOND BAG

The Albemarle Paper Manufacturing Company, of Richmond, Virginia, has announced the purchase of the Raymond Bag Company, of Middletown, Ohio. Directors of both companies have given their approval.

The announcement was made by Mr. F. D. Gottwald, president of Albemarle; W. F. Lawrence, Raymond's board chairman; and C. L. Mers, president of Raymond. This followed an approval by Raymond's board of directors on Monday, November 14, and by Albemarle's board of directors on Friday, November 11.

Raymond Bag is a manufacturer of multiwall paper shipping sacks used for packaging agricultural and food products, building materials, chemicals, drugs, dyes and minerals. The company was founded in 1896 in Cincinnati and moved to Middletown in 1910. It employs about 350 persons in a 150,000 square foot plant with a capacity of 30,000 tons of kraft paper a year.

Albemarle, founded in 1887, operates three mills in Richmond, Virginia, and another in Roanoke Rapids, North Carolina. The Richmond units produce multiwall paper shipping sacks, kraft paper, blotting and absorbent papers, and waterproof papers. The North Carolina unit manufacturers unbleached kraft pulp and paper. Total employment is about 1300 persons.

Mr. Gottwald, in his announcement, said, "This is a large step towards integration of all operations from the tree seed to the final paper product. It insures a source of supply of paper and other items to the Ohio sack plant and more than doubles Albemarle's sack sales and manufacturing facilities. Also, it will allow conversion of a much greater proportion of our kraft paper into our own paper products. Further expansion of the sack manufacturing operation is contemplated, both in Richmond and Middletown." He further stated that no change of personnel is contemplated and that the Raymond Bag Company will operate as a division of Albemarle.

In addition to the board chairman and president, officers of the Raymond Bag Company are J. H. Lawrence, vice president and secretary; W. G. Shaw, treasurer; and C. C. Mers, assistant secretary. Officers of Albemarle, in addition to Mr. Gottwald, are S. D. Fleet, vice president; B. W. Coale, vice president and secretary; K. F. Adams, vice president; and J. M. Lowry, treasurer.

NPFI Honors Editors And Essay Winners

At the annual meeting of the American Agricultural Editors Association, held in Chicago November 30, National Plant Food Institute honored two farm paper editors with the Soil Builders Award. Carl Deitemeyer, managing editor of The Nebraska Farmer and George Johnson, crops and soils editor of Successful Farming were winners of the nationwide contest sponsored annually by the Institute. Louis H. Wilson of the Institute made the presentation.

In the essay contest, sponsored by the Institute and the National Grange, Byron E. Moyer, 21, Middletown Springs, Vermont, was named national winner of $500 in the 1955 Conservation Essay Contest. Announcement of the award was made in a special Youth Recognition Ceremony at the National Grange Convention, in its 89th Annual Session in Cleveland, Ohio, Nov. 16.

Moyer's essay was judged the best of about 20,000 essays written by boys and girls in 48 states, Hawaii, and Puerto Rico. Essays in this contest were limited to 800 words on the subject of "Gaining Ground with Fertility".

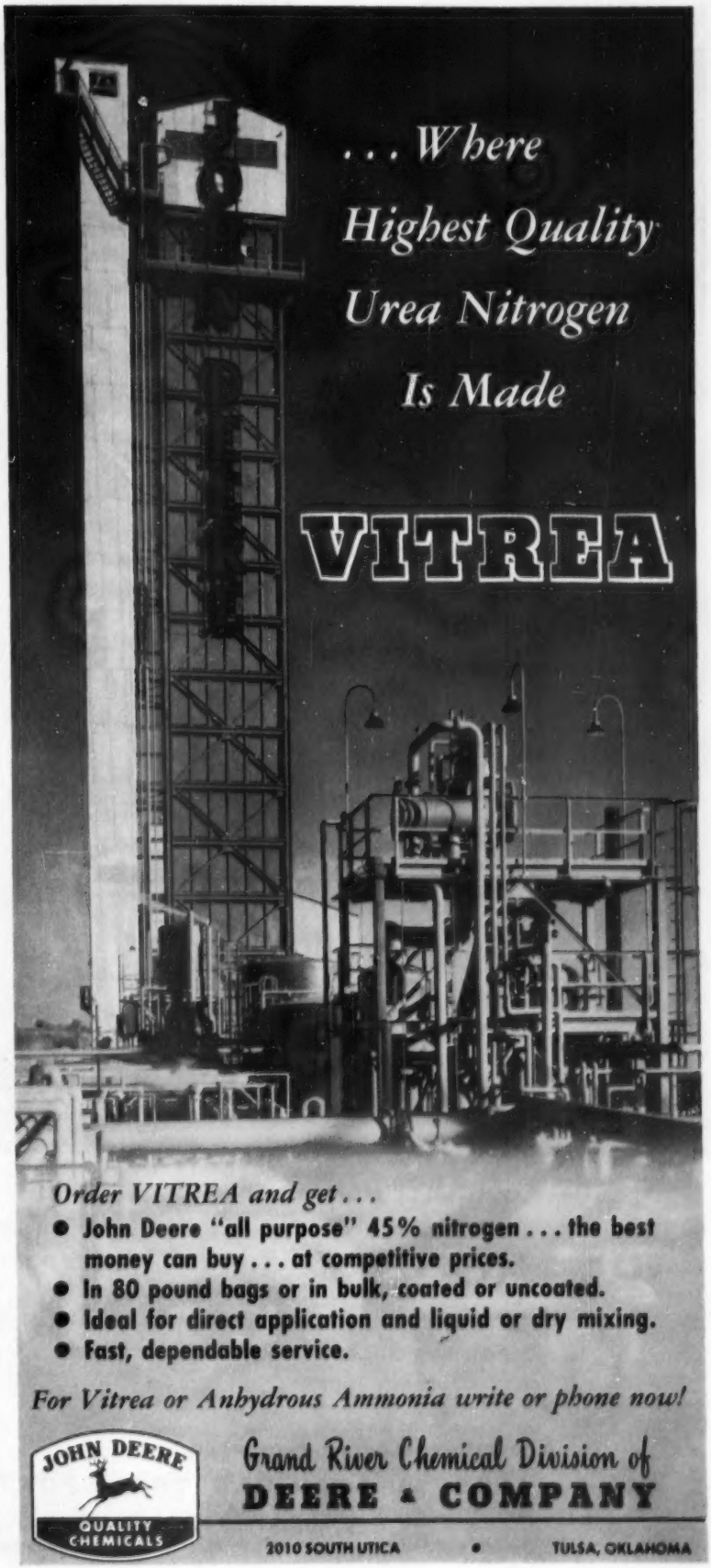
Second award of $250 went to Charles M. Rioch, 17, Glenwood, New Jersey.

Third place award of $200 went to Malcolm Niles, 16, Loleta, California.

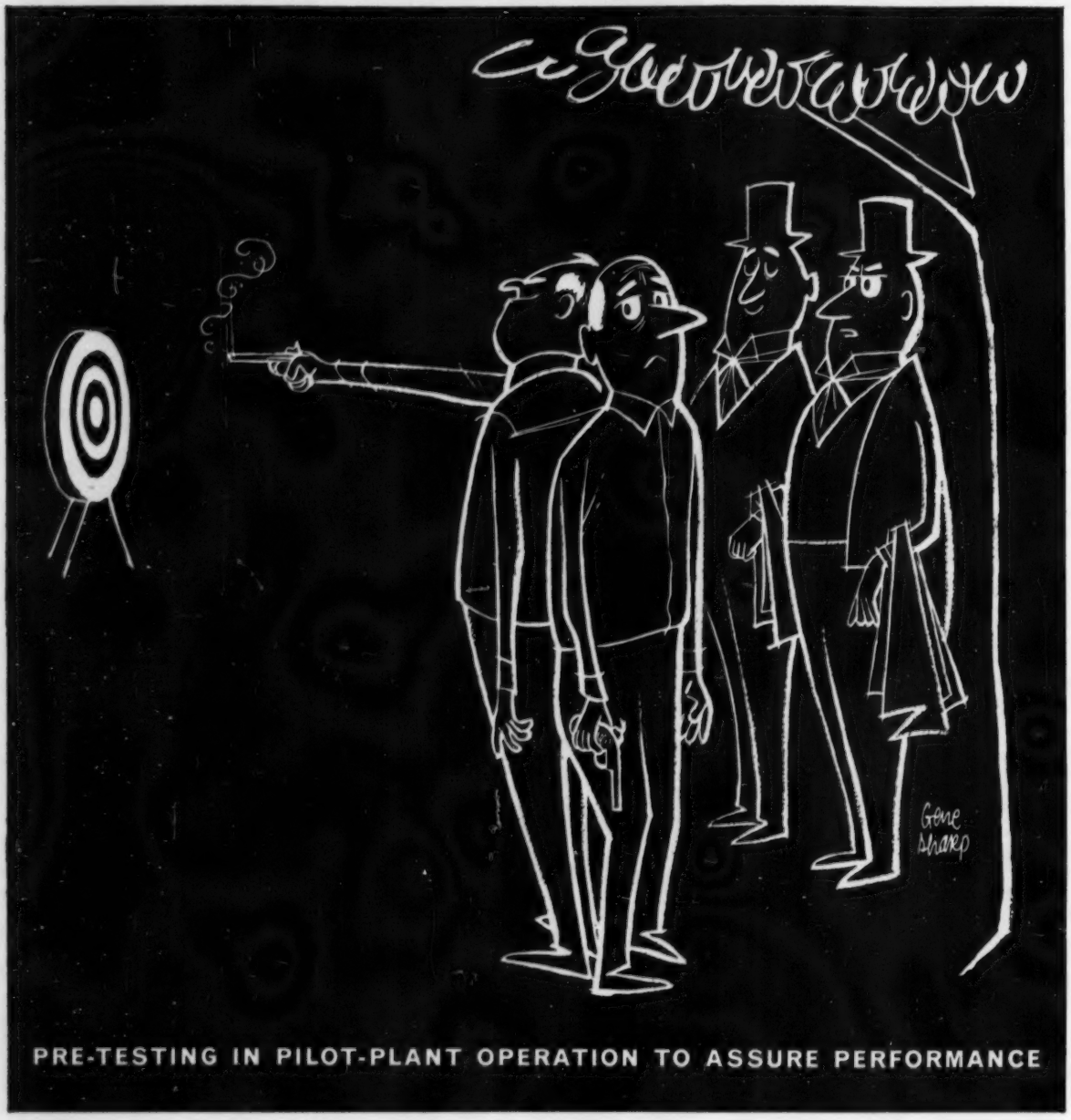
Special national awards of $100 each went to: Miss Donna Lee Anderson, 16, 509 West Lincoln, Blair, Nebraska; Miss Frances Woodward, 17, Route 2, Box 320, Aiken, South Carolina; and Gerald Copeland, 16, Route 1, Horton, Alabama.
Presentation of the awards was made by Louis H. Wilson.

Each of the six national winners also received an all-expense paid trip to the National Grange Convention.

The National Contest Judging Committee was composed of: Chairman, Ezra Taft Benson, Secretary of Agriculture; Don A. Williams, Administrator, Soil Conservation Service, U. S. Department of Agriculture; Miss Lois M. Clark, Assistant Director, Division of Rural Service, National Educational Association; Frederick Hovde. President, Association of Land-Grant Colleges and Universities: Dr. W. T. Spanton, Chief. Agricultural Education Branch, U. S. Office of Education; Miss Jennie Williams, Past President, National Home Demonstration Council: C. M. Ferguson, Administrator, Federal Extension Service, U. S. Department of Agriculture.


. . . Where
Highest Quality
Urea Nitrogen
Is Made
VITREA
Order VITREA and get . . .
• John Deere "all purpose" 45% nitrogen . . . the best money can buy . . . at competitive prices.
• In 80 pound bags or in bulk, coated or uncoated.
• Ideal for direct application and liquid or dry mixing.
• Fast, dependable service.
For Vitrea or Anhydrous Ammonia write or phone now!
JOHN DEERE
QUALITY CHEMICALS
Grand River Chemical Division of
DEERE & COMPANY
2010 SOUTH UTICA • TULSA, OKLAHOMA

LOUISVILLE DRYERS are fitted to your job for faster, more efficient performance—lower cost in the long run!'



PRE-TESTING IN PILOT-PLANT OPERATION TO ASSURE PERFORMANCE

LOUISVILLE METHOD

1. Initial survey and analysis of your particular problems.
2. *Pre-testing in pilot-plant operation to assure performance.*
3. Accurate design to meet your specific needs.
4. Top-quality fabrication in General American's own shops.
5. Follow-up checks after installation to guarantee mechanical perfection and efficiency.

PROCESS EQUIPMENT DIVISION GENERAL AMERICAN TRADE MARK

LOUISVILLE DRYING MACHINERY UNIT

GENERAL AMERICAN TRANSPORTATION CORPORATION

Dryer Sales Offices: 139 South Fourth Street • Louisville 2, Kentucky
380 Madison Avenue • New York 17, New York
General Offices: 135 South La Salle Street • Chicago 90, Illinois

Personals

At the Biloxi convention of the Mississippi Manufacturers Assn. Dennis P. Granberry of Laurel Oil & Fertilizer, Laurel, was elected president. Moved up from vice-president, he becomes the fifth president of the organization, whose members number the ranking industrial executives of the State, and who employ more than 60,000 people.

* * *

Wood Chemical Co., Lubbock, Texas has announced election of officers and directors at their October 13 annual stockholders meeting:

W. R. Wood, President; D. R. McKinney, Vice-President — Product Development and Control; Basil Smith, Vice-President — Production; Don M. Dudley, Vice-President — Sales; Roy J. Walker, Secretary-Treasurer; Virgil Smith, Director; Herman Chessir, Director; H. D. W. Naylor, Director; Kay E. Teaff, Director.

Peter C. Crolius has resigned his position as editorial assistant with the National Plant Food Institute, to become agricultural writer for the Nitrogen Division, Allied Chemical & Dye Corporation, New York City. His resignation becomes effective December 5. In his new position with Allied he will be associated with John Waugh, director of advertising and Joseph B. Martin, public relations assistant.

American Potash & Chemical Corporation has announced appointment of **Forrest Branch** to the newly-created position of director of administrative services for the company, its subsidiaries and divisions. The appointment is effective Dec. 1, according to **R. B. Coons,** company vice-president, who made the announcement.

Mr. Branch has been serving as manager of administrative services at the company's main plant at Trona, Calif. He will transfer from Trona to company headquarters at Los Angeles some time after Jan. 1.

* * *

Six **Nitrogen Division** men have been promoted in agricultural sales. The six men and their promotions are: **George A. Kalteissen, Jr.,** Eastern sales supervisor for direct application materials; **Garvin C. Matthiesen,** Midwest sales supervisor for direct application materials; **Thomas E. Freese,** supervisor for Procadian Urea Feed Mixture; **Ernest M. Harper,** supervisor for direct application solutions; **Emerson M. Jones, Jr.,** Midwest sales supervisor for fertilizer manufacture materials; and **Earl K. McNew,** supervisor for direct application materials.

All men report to **Walter S. Colvin,** director of agricultural sales, with the exception of Mr. Jones. He reports to **E. Dean Keller,** Midwest sales manager for fertilizer manufacture materials.

Miller Chemical & Fertilizer Corporation, Baltimore, Maryland, has announced the appointment of Robert C. Berry as entomologist and sales representative. Mr. Berry's assignment with Miller will bring him in close contact with the canners and farmers of the Delmarva peninsula, helping them with their plant pest control problems.

* * *

Richard F. Brown having resigned to go with another company, **Spencer Chemical Company** has advanced **John C. Denton** to be general works manager. Mr. Denton has been with them since 1942 and has been works manager at Henderson, Ky. and more recently general manager of engineering. **Byron Kern** moves up into the Denton spot, and **Robert Byorum** replaces Kern as chief engineer.

* * *

W. L. Sandel has been made Dallas field representative for **Swift's** plant food division, in charge of the full field of plant food sales and promotions, including Vigoro and Red Steer lines.

* * *

James P. Toffaleti's appointment as district manager of the South Central district for the **California Spray-Chemical Corporation** was announced by **H. J. Grady,** vice-president and regional manager—East, marketing department of Calspray. From Shreveport, Louisiana, he will supervise all operations for Calspray in Louisiana, Oklahoma, most of Texas, and adjacent parts of Arkansas and New Mexico. He has been with Calspray for nine years.

Earl Lanier Stripling, Jr. has been appointed district manager for the Southeast. From Goldsboro, North Carolina, he will supervise Georgia, South Carolina, and part of North Carolina. Mr. Stripling has been with Calspray for six years.

Cecil M. Crutchfield will be new district manager of the Mississippi Delta area.

From Troy, Alabama, he will supervise Alabama, Mississippi, and the adjacent parts of Arkansas, Florida, and Tennessee. Mr. Crutchfield has been with Calspray for nine years.

* * *

A. Chad Ogden, with Chase Bag

Tom L. Jones who has just been appointed a vice-president of Arkell and Smiths. He will be in charge of the Eastern sales division.

Co. since 1940, has been named sales manager of the firm's branch in Kansas City. He formerly served in the Dallas territory, where he has been sales manager for several years. Mr. Ogden has a wide experience serving growers and shippers of agricultural products, as well as industrial users of all types of Chase bags.

* * *

James F. King has been appointed assistant to the president of **Freeport Sulphur Company, Langhourne M. Williams,** president, announced.

* * *

Promotion of **Roy E. Mullin** to the newly created position of general sales manager of **Napco Industries, Inc.,** has been announced by **Mac Rappaport,** Napco president.

In his new capacity, Mr. Mullin will supervise sales of the Napco construction equipment division,

Four leading forms of Nitrogen

Commercial Solvents Corporation produces and supplies fertilizer manufacturers with four important forms of nitrogen. The three liquid forms are widely used for the preparation of high-analysis fertilizers and for the ammoniation of superphosphates. Exclusive, granular CSC Ammonium Nitrate fertilizer is distributed solely by fertilizer manufacturers. This high-quality, uniform product is manufactured at Sterlington, Louisiana. Adequate storage facilities assure prompt shipments and service. For complete information including Technical Data Sheets, write Agricultural Chemicals Department, Commercial Solvents Corporation, 260 Madison Avenue, New York 16, New York.

COMMERCIAL SOLVENTS CORPORATION
260 MADISON AVENUE, NEW YORK 16, N. Y.

AGRICULTURAL CHEMICALS

NITROGEN THE HEART OF THE HARVEST

manufacturer of the Napco Loader. **Dave Hanson** will continue in his present position of sales manager of this division.

* * *

Louis C. Slater, manager of the textile bag division of **Fulton Bag & Cotton Mills,** New Orleans, resigned effective November 30th. Announcement was made by Fulton officials who expressed regret at Slater's departure and extended best wishes in his future activities.

* * *

Willard P. Scott, a director of **American Potash & Chemical Corporation** since 1951, has been appointed a vice president of the company, it was announced by **Peter Colefax,** president.

He will remain a partner of the New York law firm of Oliver & Donnally, who are general counsel for American Potash & Chemical Corporation.

* * *

Election of six new directors to the membership of the board of the recently formed **Southern Nitrogen Company, Inc.,** which is constructing a $14,000,000 petrochemicals plant in Savannah, Ga., was announced by **John R. Riley,** president.

In addition to Mr. Riley, **Malcolm Smith,** board chairman, and **George V. Taylor,** vice president, the board now consists of **Franz Schneider,** former executive vice president and chairman of the executive committee of **Newmont Mining Corporation, Donald Stuart Russell,** president of the **University of South Carolina, Richard H. Samuels,** vice president of **Continental Casualty Company, Richard F. Brown,** newly elected vice president in charge of operations of Southern Nitrogen Company, Inc., **James A. Lyles,** vice president of **The First Boston Corporation,** and **W. W. Foshay,** partner of the law farm of **Sullivan & Cromwell.**

Mr. Brown was formerly vice president and general works manager of **Spencer Chemical Company.** In addition he has held the position of director of research and development, director of industrial services and chief engineer of Spencer.

An executive committee composed of Messrs. Schneider, Smith, Riley, Taylor and Brown was also elected.

* * *

Announcement was made by **Kenneth D. Morrison,** general manager of the agricultural division of **Philipp Brothers Chemicals, Inc.,** that **John H. Kraus** has joined their company. Mr. Kraus will be administrative assistant in the agricultural division, and will function as assistant to the general manager.

Prior to joining Philipp Brothers Mr. Kraus has been with **Olin-Mathieson** and **Naco Fertilizer.**

* * *

Norman T. Whittle, district manager for the multi-wall division of the **Hudson Pulp and Paper Corporation** in the Texas-Louisiana Territory, with headquarters at Houston, has been transferred to Atlanta in the same capacity for the southeastern areas.

John W. Casey, who has just joined Hudson, will fill the Houston post and represent Hudson multiwalls in the Texas-Louisiana territory.

St. Regis Buys Interest In Growers Container Corp.

St. Regis Paper Company and Growers' Container Corporation of Salinas, California, jointly announce that St. Regis has acquired for cash from Growers' authorized but unissued shares, a block of stock representing approximately a 40 per cent interest in the stock of the company. It is expected the proceeds from the sale of these shares will be used in the expansion plans of the Corporation. St. Regis does not have any container plants on the West Coast.

OBITUARIES

Sumner David Andrew, 68, for 26 years with International Paper, was buried November 18 at Camden, Ark.

Daniel L. Fitzpatrick Sr., 84, retired owner of Jersey City Fertilizer Co. which he ran for fifty years, died November 17, at his home in South Orange, N. J.

Billie Joe Hickman, 25, and **Robert Bennett,** 29, both of MFA's bulk plant at Columbia, Mo. were killed when a truck they were driving wrecked and burned, October 19.

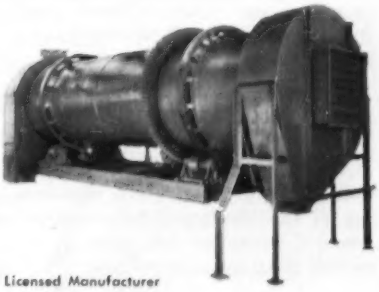
Sadocie Connellee Jones, 75, soil fertility and farm management authority, and credited with the Kentucky liming and fertilization program, died October 27 at Lexington.

DeWitt T. McIver, 59, former general manager of Freeport Sulphur, died in a hospital at New Braunfels, Texas, nearby the ranch where he has lived since his 1947 retirement.

DRYERS AMMONIATORS* GRANULATORS* ELEVATORS COOLERS CONVEYORS for the Fertilizer Industry

CONVENTIONAL DRYER

Heavy-Duty rotary unit with furnace, burner, breeching and air handling system. Used for ammoniated granular fertilizers and other chemicals. Also DehydrO-Mat Variable Inclination Dryers (Pat. pend.).



ROTARY COOLER

Highly efficient shelf design for quick thermal release, with special feed and discharge breechings. Rotary seals prevent air losses.

EDW. RENNEBURG & SONS CO. Baltimore 24, Maryland, U.S.A.

* TVA Licensed Manufacturer

Literature and information on request.

Regional Societies

ARE HARD AT WORK

Pac NW Association Elects Meeker President

At the annual convention of the Pacific Northwest Plant Food Association, held November 2-3 at Bend, Oregon, the following officers and board members were elected:

Frank Meeker, Meeker - Hughes Company, Salem, Oregon, president; Ben McCollum, J. R. Simplot Company, Pocatello, Idaho, vice president; Robert W. Finch, Swift and Company, North Portland, Oregon, treasurer; Leon S. Jackson, secretary.

Board Members: S. W. Martin, Yakima Valley Spray Company, Yakima, Washington; Henning Waltersdorph, Magnolia Fertilizer Company, Seattle, Washington; Frank Taylor, Oregon-Washington Fertilizer Company, Seattle, Washington; Robert Allard, Wilbur Ellis Company, Seattle, Washington.

The board held a meeting November 30th, at the Multnomah Hotel, Portland, Oregon, to discuss plans for the coming year. Rod Bertramson, Secretary, and Grant Braun, chairman of the Soil Improvement committee presented their plans and requests for the coming year. Both were elected at Bend.

The association is planning a fertilizer dealers day at Oregon State College January 18 from 10 AM to 4 PM. The Association's committee met with Tom Jackson of the College to prepare the program. They ask that fertilizer manufacturers push this meeting through their salesmen and otherwise.

Alabama Society Annual Meeting

As we go to press the Alabama Soil Fertility Society will be meeting at the Whitley Hotel in Montgomery, December 8-9, with an excellent program planned.

150 At Mississippi Fertilizer Conference

The 150 delegates who attended the Mississippi Fertilizer Conference in Biloxi, late in October, heard Russell Coleman, National Plant Food Institute on fertilizer to cut costs; C. W. Sullivan on federal aid to farmers; W. B. Andrews on ammoniates and phosphates in fertilization. They voted to return to Biloxi next year.

Georgia Society Annual Meeting January 17

Meeting jointly with the Georgia Section of the American Society of Agronomy, as has been their practice for some years, the Georgia Plant Food Educational Society will hold its 1956 annual meeting at the University of Georgia on January 17, beginning at 1. Dr. Fielding Reed and the program committee have arranged for a discussion of the functions and future plans of the newly reorganized fertilizer division of Georgia's agriculture department, Phil Campbell, Commissioner of the Department of Agriculture.

National Plant Food Institute vice-president, W. R. Allstetter, will talk on "Tools for Selling Fertilizer." There will be discussion of the activities of the Society and its plans for the year ahead.

At the annual banquet, the one talk will be by Dr. M. B. Russell, University of Illinois agronomy department head, and entertainment planned by Jim Reed and the materials companies will conclude the meeting.

Arkansas Society Annual Meeting

The Arkansas Plant Food Educational Society met in Little Rock November 18 in conjunction with the 5th annual Arkansas Fertilizer School.

Nebraska Institute Re-elects Peterson

H. L. Peterson was re-elected president of the Nebraska's Fertilizer Institute at their Lincoln meeting October 31. Other officers include Dick Bennett of Omaha, vice-president; S. D. Daniels of Fremont, secretary, and George Spiedel of Waverly, treasurer.

New members elected to the board of directors are Mel Beerman of Dakota City, Frank Brady of Atkinson, and G. W. Erickson of Lincoln.

Science Group Meeting December 26-31

American Association for the Advancement of Science, whose membership covers the whole range of science, and which was organized in 1848, will meet in Atlanta, Georgia, Dinkler Plaza Hotel, December, 26-31 inclusive.

Among the items which will be of interest to our readers are a symposium on atomic energy applied to agriculture, which will run in four sessions. There will be a panel on hazards of household and agricultural poisons. The American Phytopathological Society, affilliated with AAAS, has 191 papers on its agenda concerning crop diseases.

A Symposium on Southern agriculture from 1913 to 1956; another on Tobacco and one on Cotton are also included.

As 16 sections of AAAS and 68 participating scientific societies are taking part in the meeting, it is expected that more than 3000 will attend.

INDUSTRY CALENDAR

Date	Organization	Place	City
	1956		
Jan. 4-5	Weed Society of America	New Yorker	New York, N. Y.
Jan. 16-18	Sou Weed Conf.	Jung	New Orleans, La.
Feb. 6-8	Sou. Ag. Workers	Biltmore	Atlanta, Ga.
Feb. 15-17	Western Weed Control Conf.	Univ. of Calif.	Davis, Calif.
Mar. 4-6	Sou Safety	Biltmore	Atlanta, Ga.
Mar. 14-18	Nat'l Ag. Chem.	Hollybeach	Hollywood Beach, Fla.
June 10-13	NPFI	Greenbrier	White Sulphur, W. Va.
June 28-30	Sou Control	Roanoke	Roanoke, Va.
June 28-30	Pacific N.W.		Yakima, Wash.
July 18-20	SW Grade	Bucaneer	Galveston, Tex.
July—	Eastern Canada		Mont Tremblant, Que.
Oct. 19	Control Officials	Shoreham	Washington, D. C.

The first ammonia plant in the Intermountain Area

Blaw-Knox engineers have designed, and now are constructing a new anhydrous ammonia and fertilizer plant for U. S. Steel's Columbia-Geneva Steel Division at Geneva, Utah. It is not only the first anhydrous ammonia plant for the Mountain States region, but is also the first installation of its kind in a major steel plant in this country. Raw coke oven gas is used as the source of hydrogen for ammonia synthesis.

This new facility will produce high quality fertilizers which are in wide demand. An annual total of over 100,000 tons of products will be available for shipment. This is a sizable volume on a regional basis, making the installation a significant addition to the expanding agricultural and processing industries of the Intermountain and Northwest areas.

Why not discuss your expansion plans—new plants or modernization of existing ones—with Blaw-Knox engineers? We welcome the opportunity to submit our recommendations.

This new Geneva Works project includes:

1. A 200-tons-per-day anhydrous ammonia plant.
2. A nitric acid plant.
3. A fertilizer grade ammonium nitrate plant, producing both solid and solution forms of the product.
4. The necessary complement of auxiliary units, including administration and service buildings, utilities systems, warehouses and extensive handling, bagging, storage, and shipping facilities.

BLAW-KNOX COMPANY

Chemical Plants Division

Pittsburgh 22, Pennsylvania / Chicago 1, Illinois

EXACT WEIGHT Scales Cuts Labor Costs Eliminate Over-weights

MODEL 2224
SACKING SCALE

One simple operation does the work of three with the EXACT WEIGHT Sacking Scale. One man can bag, weigh, and check over 100 tons of free-flowing materials per day from overhead hopper to foot level conveyor. Savings in time plus savings in over-weights quickly pay for an installation.

In addition to the pedestal type illustrated EXACT WEIGHT Sacking Scales are available in overhead and portable mountings. Also come complete with electrical or air-operated valves for automatic operation.

EXACT WEIGHT Platform Scale

This EXACT WEIGHT Platform Scale has a capacity of 500 pounds, yet provides outstanding speed and accuracy. A hydraulic damping mechanism brings weight indicator to rest quickly—and high-ratio visible indication enables operator to make an accurate reading at a glance. Indicator travel of three inches over and under is equivalent to three pounds over and under. Sturdily built, with permanent alignment of operating parts. Write for details on Model 4005-2.

Sales and Service
Coast to Coast

Exact Weight Scales

Better quality control
Better cost control

THE EXACT WEIGHT SCALE COMPANY

906 W. Fifth Avenue, Columbus 8, Ohio
In Canada: P. O. Box 179, Station S, Toronto 18, Ont.

How one firm proved that Fulton's New Sleeve could lick their Sifting Problem . . .

At a Saving of $2.25 a Thousand Bags!

BY J. FRANK GREELEY
Director of Multiwall Paper Bag Sales
Fulton Bag & Cotton Mills

They Had to be Shown. Sifting could make a big profit-and-loss difference in this company's operation. Fulton's new Ful-Flex Non-Sifting Sleeve looked different and promised new economies. They tried it out.

Comparison Showed that Fulton's Ful-Flex Sleeve was of extra size, and made of special flexible paper. They tested it thoroughly. First...

Actual case history in our files—name on request.

They Tested for Sifting on the conveyor belt. Careful scrutiny of the floor area underneath showed no significant sifting had developed. What would happen during shipping? They checked . . .

A Double Check at point of arrival was made. Floor of freight car showed barely perceptible sifting had taken place. Weigh test proved sifting loss had been negligible . . . at a saving of $2.25 a thousand!

Fulton
BAG & COTTON MILLS

ATLANTA • CHICAGO • DALLAS • DENVER • KANSAS CITY
LOS ANGELES • MINNEAPOLIS • NEW ORLEANS • NEW YORK
OKLAHOMA CITY • PHOENIX • ST. LOUIS • SAN FRANCISCO
SAVANNAH • WINTER HAVEN

Let's investigate whether Ful-Flex sleeve can solve a problem for you.

GENERAL SALES OFFICE
FULTON BAG & COTTON MILLS
P. O. Box 198, New Orleans 3, La.

We have a sifting problem in packing _____

(Please feel free to write Fulton full details in complete confidence)

Name _____

Company _____

Address _____

Please write ☐ Have representative call ☐

CF Staff–Compiled TONNAGE REPORTS

FERTILIZER TONNAGE REPORT (in equivalent short tons) Compiled by COMMERCIAL FERTILIZER Staff

	October		September		August	July-Aug.-Sept. Quarter		January thru June		July thru December		Year (July-June)	
State	1955	1954	1955	1954	1955	1955	1954	1955	1954	1954	1953	1954-55	1953-54
Alabama	52,339	94,688	29,734	50,754	17,375	61,996	77,244	844,071	924,968	267,041	147,702	1,114,238	1,074,892
Arkansas	13,716	16,471	16,855	11,649	7,414	33,562	22,882	270,894	313,787	59,887	52,438	330,776	366,225
Georgia	35,346	36,258	13,340	11,784	16,226	80,739	63,391	1,047,875	1,147,157	225,083	218,027	1,273,445	1,361,254
Kentucky	.....	*	17,130	19,914	*	33,388	35,778	433,102	489,024	91,386	88,905	524,488	577,929
Louisiana	15,019	24,535	12,007	11,823	3,954	22,849	25,153	1,047,875	250,747	78,067	74,471	310,848	325,218
Missouri	115,485	83,927	105,139	83,912	47,430	164,002	147,678	394,979	500,020	268,257	256,427	682,690	756,457
N. Carolina	74,504	80,948	34,182	41,805	15,575	62,174	71,387	1,566,158	1,558,472	264,475	257,100	1,830,633	1,815,572
Oklahoma	23,619	21,914	27,295	19,084	9,629	40,347	30,201	63,799	72,809	58,406	71,558	122,305	144,367
S. Carolina	27,987	25,780	18,134	20,722	23,221	52,710	40,477	791,206	752,639	132,604	183,919	928,715	936,558
Tennessee	31,494	53,127	21,441	19,435	11,817	59,120	52,612	282,462	405,756	167,383	107,544	523,349	523,303
Texas	55,596	87,711	42,850	36,121	12,588	76,141	63,080	371,587	374,309	212,885	186,097	584,269	560,381
Calif.	(reports submitted quarterly)					173,411	141,875	603,857	513,300	318,270	317,270	922,127	830,327
Virginia	(reports submitted quarterly)					.....	77,959[1]	636,585	620,261	159,185	160,715	795,770	780,931
Indiana	(reports submitted semi-annually)							873,966	896,104	284,994	283,987	1,158,960	1,180,091
New Jersey	(reports submitted semi-annually)							.....	231,686[1]	53,830	57,923	.....	289,614[1]
Washington	(reports submitted semi-annually)							124,186	101,779	58,162[1]	*	182,348[1]	*
TOTAL	448,105	525,359	338,108	327,003	165,229	860,439	771,758	8,537,508	8,921,132	2,641,753	2,464,088	11,102,613	11,233,505

..... (not yet reported) * Not compiled [1] Omitted from column total to allow comparison with same period of current year.

MARKETS

ORGANICS: Demand for organic ammoniates is good, particularly in the Southeast and producers of Nitrogenous Tankage are in well sold positions at prices varying from $4.00 to $4.60 per unit of Ammonia, bulk, f.o.b. production points. Sewage Sludge Tankage is indicated, depending on production point, at $2.95 per unit of Ammonia and 50¢ per unit of APA to $3.00 per unit of Nitrogen and 40¢ per unit of APA, bulk, f.o.b. production point for fertilizer purposes. Feather Tankage is indicated at around $4.10 per unit of Ammonia, in bulk, delivered in the Southeast.

CASTOR POMACE: Producers are practically sold up for the current month and exceedingly limited supplies are indicated for the balance of the calendar year at $4.000 per ton, in bags, f.o.b. Northeastern production points.

DRIED BLOOD: Dried Unground Blood, in bags, is indicated nominally at $5.00 per unit of Ammonia at Chicago and New York.

POTASH: No unusual activity is noted in the Potash market and supplies appear to be adequate at previously indicated contract prices. Some shipments of Imported Muriate of Potash have been arriving recently at Atlantic ports.

GROUND COTTON BUR ASH: Demand continues good for this source of Potash which is primarily in the form of Carbonate of Potash. Supplies are taken up through the calendar year but are available for shipment January/forward. Current analyses vary from 38% to 42% K_2O which makes for a delivered cost approximating that of Domestic Sulphate of Potash.

PHOSPHATE ROCK: No change in the current Florida Phosphate Rock situation is noted and supply and demand are in good balance.

SUPERPHOSPHATE: Production continues steady and supply is adequate for current needs. Prices are steady in general.

AMMONIUM NITRATE: Demand is in seasonal dimensions and prices steady.

SULPHATE OF AMMONIA: Buying demand is lagging behind production and a recent purchase for Korea was insufficient to relieve the stock pile position greatly.

NITRATE OF SODA: Prices continue the same as $51.25 per ton, in bags, f.o.b. cars at Atlantic and Gulf ports and stocks are being built to take care of the expected spring demand.

GENERAL: Movement of mixed fertilizers, except for Florida, at present is not in great volume. Fertilizer manufacturers are continuing to build up inventories of raw materials preparatory to spring demand.

Bradley & Baker Buy Cal-Nitro Brand

The well-known trademark Cal-Nitro, which was used for over twenty years by Synthetic Nitrogen Products Corporation to designate a nitrogen fertilizer, has been purchased by and transferred to Bradley & Baker for use in connection with the sale of their nitrogen fertilizer, it is announced by Albert Baker, Jr., member of the firm of Bradley & Baker and Miguel Tegtmeyer, who recently resigned as president of Synthetic Nitrogen Products Corporation.

Mr. Tom Davies, for many years Southeastern sales representative for Synthetic Nitrogen Products Corporation, will join the sales staff of Bradley & Baker and Mr. Tegtmeyer has been retained by Bradley & Baker as a consultant. This arrangement will assure for the future ample supplies of nitrogen top-dresser for the fertilizer industry to be available under the well-established trademark, Cal-Nitro.

St. Regis Announces Reinforced Bags

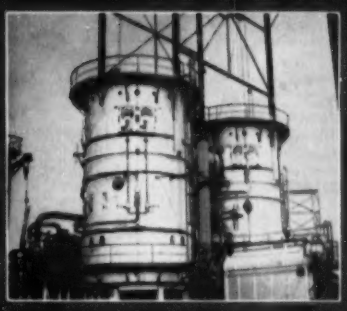
Strength where it is needed most, combined with lower cost, are provided by a new principle of multiwall bag construction developed by St. Regis Paper Company. Structural strips between the walls are used to reinforce the gusset areas and the edges of heavy duty bags, where the greatest stress occurs.

Thus far this principle has been applied commercially only to multiwall bags of five and six ply construction. For a bag comparable to a five-ply bag, for example, one structural strip is placed in each gusset of a four-ply bag, thereby reducing the amount of paper used in the package with no sacrifice of performance and at a saving.

The savings possible are indicated by the fact that reducing the amount of paper required can result in savings of from 5-15% of the cost of the bag.

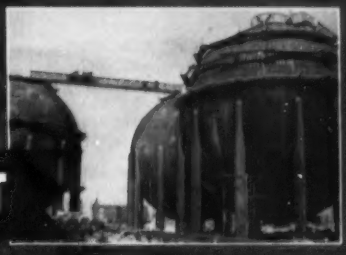
These progress pictures, made in August, show portions of Escambia Bay Chemical Corporation's nitrogen plant now nearing completion at Pensacola, Florida

ON SCHEDULE



Primary gas reformer units which are the heart of the process where natural gas is cracked to hydrogen.

Gas purification section where the main gas stream is freed of carbon dioxide and carbon monoxide in order to insure feeding a pure nitrogen-hydrogen gas stream to the converter.



Three storage spheres, with a total capacity of over 6,000 tons of anhydrous ammonia.

ESCAMBIA BAY

ESCAMBIA BAY CHEMICAL PLANT

Nitrogen materials for agriculture and industry will be available from the Escambia Plant which will provide complete nitrogen production for the Southeast. Products will include anhydrous ammonia, ammonium nitrate, nitrogen solutions and nitric acid.

Escambia Bay Chemical Corporation is owned by United Gas Corporation, Electric Bond and Share Company and National Research Corporation.

Please address communications to

ASHCRAFT-WILKINSON CO.

Exclusive Distributors

Atlanta, Georgia

DISTRICT OFFICES

Norfolk, Va. • Charleston, S. C. • Tampa, Fla. • Jackson, Miss. • Columbus, Ohio

INSTITUTE ESTIMATE OF 1954-55 CONSUMPTION

FERTILIZER CONSUMPTION IN THE UNITED STATES

1954-55 With Comparisons

(Short Tons)

STATE	1952-53[1]	1953-54[1]	1954-55[2]
NEW ENGLAND	**469,374**	**415,596**	**448,131**
Maine	211,381	171,679	189,471
New Hampshire	21,391	15,767	18,103
Vermont	49,506	38,331	47,856
Massachusetts	85,112	84,560	84,972
Rhode Island	15,490	15,398	16,042
Connecticut	86,494	89,861	91,687
MIDDLE ATLANTIC	**1,623,843**	**1,567,579**	**1,539,334**
New York	658,050	607,224	637,535[3]
New Jersey	276,505	289,508	204,119
Pennsylvania	689,288	670,847	697,680[3]
EAST NORTH CENTRAL	**4,328,823**	**4,202,676**	**4,079,353**
Ohio	1,162,384	1,083,775	1,043,376
Indiana	1,168,130	1,153,229	1,140,601
Illinois	951,930	941,506	829,122
Michigan	643,933	596,034	646,107
Wisconsin	402,446	428,132	420,147
WEST NORTH CENTRAL	**1,795,137**	**2,022,746**	**2,033,196**
Minnesota	258,476	317,331	368,181
Iowa	525,610	628,663	559,071
Missouri	580,035	597,841	577,383
North Dakota	40,235	47,617	62,644
South Dakota	16,173	29,846	36,713
Nebraska	144,425	193,577	199,794
Kansas	230,183	207,871	229,410
SOUTH ATLANTIC	**6,663,504**	**6,538,049**	**6,486,060**
Delaware	90,588	94,655	100,334
Maryland	301,098	310,581	316,792[3]
D. C.	2,587	2,695	2,800
Virginia	833,625	779,173	795,665
West Virginia	87,134	76,685	81,655
North Carolina	1,869,053	1,822,442	1,791,105
South Carolina	973,021	936,865	915,794
Georgia	1,367,663	1,346,831	1,272,992
Florida	1,138,735	1,168,122	1,208,923
SOUTH CENTRAL	**4,511,012**	**4,356,795**	**4,089,173**
Kentucky	599,925	573,344	516,146
Tennessee	578,793	523,078	462,984
Alabama	1,252,783	1,179,030	1,117,364
Mississippi	729,149	727,920	645,152
Arkansas	364,465	368,091	330,714
Louisiana	313,982	314,424	310,788
Oklahoma	125,776	130,784	116,789
Texas	546,139	540,124	589,236
WESTERN	**1,590,441**	**1,731,493**	**1,842,933**
Montana	25,453	28,418	32,000[3]
Idaho	69,272	84,456	90,000[3]
Wyoming	11,474	10,151	12,000[3]
Colorado	47,722	46,275	44,811
New Mexico	27,491	22,347	29,147
Arizona	119,453	134,320	138,742
Utah	31,564	28,104	30,352[3]
Nevada	3,584	3,414	1,669
Washington	117,856	154,052	182,348
Oregon	133,947	132,422	151,467
California	1,002,625	1,087,534	1,130,397
UNITED STATES	**20,982,134**	**20,834,934**	**20,518,180**

Prepared by: National Plant Food Institute.

[1] Revised. Derived from "Commercial Fertilizers, Consumption in the U. S.," 1952-53 and 1953-54, by Walter Scholl, Hilda M. Wallace & Esther I. Fox, Fertilizer and Agricultural Lime Section, Soil and Water Conservation Research Branch, Agricultural Research Service, USDA.

[2] Preliminary, subject to revision.

[3] Estimated; margin of error may be large.

Farmers in the United States during the 1954-55 crop year used an estimated 20,518,180 tons of fertilizers, a decrease of 1.52 per cent below the 1953-54 tonnage, reports the National Plant Food Institute, Washington, D. C.

Notwithstanding the reduction of 316,754 tons, the total tonnage of all fertilizers used is the third largest on record.

A new record in terms of plant nutrients is indicated on the basis of reports received from state fertilizer control officials and indust: y sources, which the Institute attributes to higher plant food content of fertilizer. The 1953-54 consumption on a plant nutrient basis, as reported by the U. S. Department of Agriculture, was 5,778,510 tons.

Institute agronomists point out that "the consumption pattern in the Middle West, which has shown a steady increase in recent years, appears to have leveled off in 1954-55" and that the "only significant increases this year were registered by the New England and Western regions."

"The increase of 7.8 per cent in New England is particularly notable because consumption has been steadily decreasing in that area in recent years," they stated. "The South Central region, which includes a major portion of the country's cotton acreage, showed the largest decrease. Smaller decreases were registered in the Middle Atlantic and East North Central regions. Generally, it is believed that drought, depressed farm commodity prices, and crop controls were among the principal causes for the decline."

Other consumption estimates show North Carolina retained its ranking as the No. 1 fertilizer consuming state with 1,791,105 tons used in 1954-55. Other states following in order of consumption were: Georgia, 1,272,992 tons; Florida, 1,208,923 tons; Indiana, 1,140,601 tons; California, 1,130,397 tons; Alabama, 1,117,364 tons; and Ohio, 1,043,376 tons.

Fertilizer consumption in the United States, by regions, in 1954-55, with percentage change, compared with 1953-54, is estimated by the institute as follows:

New England, 448,131 tons, up 7.8 per cent; Middle Atlantic, 1,539,334 tons, down 1.8 per cent; East North Central, 4,079,353 tons, down 2.9 per cent; West North Central, 2,033,196 tons, up 0.5 per cent; South Atlantic,

Shovel-loading train of gondolas.

Crude Sulphur

for Industrial Use

from the properties of

Texas Gulf Sulphur Co.

75 East 45th Street • New York 17, N. Y.

Producing Units

- **NEWGULF, TEXAS**
- **MOSS BLUFF, TEXAS**
- **SPINDLETOP, TEXAS**
- **WORLAND, WYOMING**

For your lead requirements!

CHEMICAL AND ANTIMONIAL

sheet lead and lead pipe

Evans Metal Company

Box 97 Northside Station • ATLANTA, GEORGIA • Elgin 4338

Southern Steel Equip. Co.

936 Adamson St. SW
Atlanta, Ga.

Phone WAlnut 5813

FABRICATORS

of

Steel and Stainless Steel Tanks

Rotary Fertilizer Dryers & Coolers

Batching Hoppers

Dust Handling Equipment

Arrives on Schedule

FUR-AG®

the sterilized organic conditioner

For years . . . First Choice of Leading Fertilizer Manufacturers

Fur-Ag is readily available . . . inexpensive, produced in volume, shipped to you on schedule 12 months a year. Among Fur-Ag's many advantages: reduces bag set, speeds up curing in the pile, provides bulk, sterilized—free from plant diseases, insects and weed seeds. Fur-Ag's dark, *natural color* helps make a rich-looking product. Write today for Bulletin 127.

The Quaker Oats Company

CHEMICALS DEPARTMENT

345 The Merchandise Mart, Chicago 54, Illinois

For Bagging **— CHI-ORGANIC —** *For Mixing*

(Chicago Activated Sludge)

"THE ALL-ORGANIC PLANT FOOD WITH THE BUILT-IN CONDITIONER"

CHICAGO FERTILIZER COMPANY

Exclusive Sales Representatives

ALEX. M. McIVER & SON

P. O. Box 155 Charleston, S. C. Tel. 3-4828-29

6,486,060 tons, down 0.8 per cent; South Central, 4,089,173 tons, down 6.1 per cent; and Western, 1,842,933 tons, up 6.4 per cent.

Advance Report of Canadian Tonnage

Herewith is an advance view of the figures on which will be based the report, due out shortly, from the Dominion Bureau of Statistics, Ottowa, on the fertilizer trade in Canada from July 1, 1954 to June 30, 1955.

THE FERTILIZER TRADE IN CANADA, YEAR ENDED JUNE 30, 1955
(Preliminary figures)
Table 1—Fertilizer Materials Sold During the Year Ended June 30, 1955

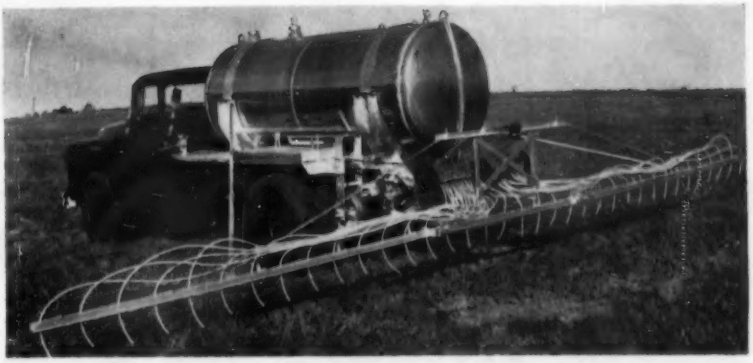
Item	TOTAL SOLD IN CANADA
Anhydrous ammonia	1,402
Nitrogen solution	202
Sulphate of ammonia	3,990
Nitrate of soda	959
Cyanamide	3,156
Ammonium nitrate	22,298
Ammonium phosphate—11-48-0	45,731
16-20-0	10,956
Superphosphate—20%	25,571
45%	302
Natural phosphate rock	7,316
Basic slag	634
Bone meal, bone flour, etc.	1,517
Muriate of potash—50%	5
60%	4,622
Sulphate of potash	653
Tankage	352
Sheep manure	1,569
Dried blood	171
Sewage sludge	6,000
Other fertilizer materials (x)	1,879
TOTAL MATERIALS	139,285
Mixed fertilizers (see Table 2)	651,493
TOTAL, 1954	811,641

(x) Lime has not been included.

Table 2—Mixed Fertilizers Sold During Year Ended June 30, 1955 (Concluded)

Formula	Total sold in Canada	Exported from Canada	TOTAL SOLD
5-20-0	170	—	170
6-8-6	2,367	—	2,367
6-9-9	256	1,059	1,315
6-9-12	4,628	13,426	18,054
6-10-4	1,928	—	1,928
6-10-10	436	—	436
6-12-6	4,221	417	4,638
6-12-12	39,638	28	39,666
6-18-15	291	—	291
6-28-25	190	—	190
6-30-15	1,353	—	1,353
7-7-7	1,180	498	1,678
8-9-10	—	200	200
8-10-5	1,732	—	1,732
8-10-10	—	110	110
8-12-12	342	4,340	4,682
8-12-16	—	4,544	4,544
8-16-10	100	—	100
8-16-16	85	2,201	2,286
8-24-20	447	—	447
9-5-7	2,023	—	2,023
9-9-7	1,612	27	1,639
10-5-10	3,760	—	3,760
10-6-4	1,009	7	1,016
10-10-10	32,567	3,428	35,995
10-15-15	—	916	916
10-20-10	2,535	—	2,535
10-32-10	286	—	286
10-52-17	110	—	110
11-24-20	138	—	138
Misc. other mixtures	2,662	429	3,091
TOTAL, 1955	651,493	36,014	688,507
TOTAL, 1954	651,160	39,379	690,539

NOTE: Figures in this table include tobacco fertilizers, and fertilizers containing boron and magnesium oxide.



General Metals, Inc., of Greensboro, N. C., announces this latest addition to their family of nitrogen solutions field applicators. It is the Truck-Mounted "Speedy-Spread" especially designed for top-dressing of large acreages.

The manufacturer estimates that at least 150 acres of level ground can be covered by this applicator in an ordinary day on two fillings of the tank. The tank can also be used as a farm storage or "nurse" tank with gasoline-powered compressor which is available at extra cost.

General Metals, Inc. is prepared to mount the unit on the customer's truck or can be shipped ready to be mounted.

MORROW PLOTS PROVE THAT CHEMICALS DO THE JOB

MORROW PLOTS
1955 Corn Yields

Plot 3 continuous corn

Treatment*	Bu/A
None	36
MLP (Residual)	79
LMPK (1955)	86
MLP - NFK (1955)	98

Plot 4 corn & oats

None	43
MLP (La.) (Residual)	98
LMPK (1955)	97
MLP (La) - NPK (1955)	107

Plot 5 Corn-oats-clover

None	63
MLP (Residual)	100
LMPK (1955)	102
MLP - NPK (1955	101

*1955 per Acre Treatments:

Limestone: 5 tons to unlimed areas
Nitrogen: 200 lbs. from Urea on plots not having legumes and 100 lbs. to plots having legumes
Phosphate: 100 lbs. P_2O_5
Potash: 100 lbs. K_2O
One-half of the limestone, nitrogen, and phosphorus was plowed down. The other half, and the potash, was broadcast after plowing.

The Morrow Plots of U of Illinois, proving agronomic theories since 1876 have proved again that chemical fertilizers do the job. Last spring they fertilized strips, as is shown in the table above with the corn yields tabulated. Professor of Soil Fertility A. L. Lang, who supplied us this table will shortly issue a complete report on this most recent experiment on this historic patch of soil.

Crop Chemical Plant Expansions

Costa Rica's new Quimicas Agricolas Centroamericanos Ltd. near San Jose can turn out any variety of insecticide concentrate at the rate of 150 weekly tons of dry and wettable powders.

Mexico's Foster D. Snell proposes a $5,000,000 private company to produce a plant to turn out 6,000 annual tons of chlorine base insecticides.

Spain's Union Quikmica del Norte de Espana is going into the production of herbicides using 2, 4-D in its plant at Axpe.

Africa's Congo province of Kivu can boost pyrethrum production 50% any time the demand calls for it. And the reason they say they expect such demand is that insects cannot develop an immunity to pyrethrum as they do to synthetics.

Ryania Gets USDA Boost

A natural insecticide which comes from the stems of a Trinidad shrub turns out to be a fine, selective insecticide, without any residue tolerances under the Miller Act, according to recent findings of USDA. Only trouble now is its high cost.

CROP CHEMICALS

International agricultural scientists examine the effects of an antibiotic used to combat plant diseases while visiting the Squibb Institute for Medical Research, New Brunswick, N. J. Above, a group inspects pepper, bean, corn and tomato plants which have been treated with Phytomycin, an Olin Mathieson Chemical Corporation antibiotic product used to combat plant diseases. From left to right are: Robert Zerkel, Olin Mathieson Insecticides Division; Dr. Andre C. Francis, Centre National de Researchers, Zootechniques, France; Dr. J. Tiews, University of Munich, Germany; Professor Johannes Brueggemann, Institute of Physiology and Animal Nutrition, University of Munich, Germany; Dr. H. Zucker, University of Munich, Germany; Dr. Fred E. Deatherage, Department of Agricultural Biochemistry, Ohio State University, Columbus, Ohio; and Dr. J. Schole, University of Munich, Germany.

NORTH CAROLINA FOLDER TELLS CLEAR-CUT METHYL BROMIDE STORY

"The King of Pests" is what the Saturday Evening Post has called the worm known as the Nematode, and might well be called Nemesis instead, so deadly is its effect on crops. In fact, it is responsible for sending whole areas of Southern farmlands back to brush and pine, and is accused of costing farmers a tithe of all they grow.

Citrus, potatoes, tobacco, bulbs, vineyards, truck gardens . . . every State is searching for the answer. So it seems pointed right now to present again the very complete and succinct bulletin which was originally written by R. R. Bennett, H. H. Nau and S. N. Hawks, Jr., extension tobacco specialists for the North Carolina AES, and published by that fine branch of the State College.

This tells the story of Methyl Bromide in the battle against the Nematode. In North Carolina they have found it works, gives good Nematode control. At the same time it checks weeds and grass in plant bed soil.

As the bulletin points out, pulling weeds by hand is an expensive occupation. And Nematode-free tobacco plants have a much better chance in the field than infested plants. What's more, better results may be expected from field fumigation if the soil of the beds is also treated.

The methyl bromide treatment, they report, can be used in the fall or spring . . . in fact whenever the outside temperature is 50 degrees or more, in fact best results are had when the temperature is around 50 to 60 degrees at the time of the treatment. Methyl bromide can be used up to within three to four days of seeding.

The gas penetrates best if the soil is not wet, but if there is sufficient moisture to soften the seed coat.

The folder which tells this story goes on to give the most careful and practical explanation of how to use methyl bromide. It is known as "Extension Folder No. 101." Point by point it shows the farmer how to apply, in the simplest terms.

He needs an air-tight cover of plastic or tough Kraft paper to confine the gas in contact with the plant bed soil; three flat pans holding a half gallon or more each; three pieces of plastic or rubber hoses; one jiffy applicator; three bricks with holes in them, or three old plow points; 20-30 bags half filled with straw; a shovel to be used after the soil has been prepared. That gives an idea of the simple terms in which this folder is written. The steps by which these supplies are put to work are just as clearly laid down. You put the hose in the pan, and weight it down with the brick or the old plow point "to keep the hose from wiggling out of the pan when the gas rushes through." That is a typical quote. If you have Nematode problems in your area—write to North Carolina for this folder. It may save your farmers a lot of money.

One Thing Leads To Another

It is interesting how the balance of nature, once disturbed, calls for added crop chemicals. The National Cotton Council in publicizing their December meeting point out that fertilizer applied to cotton makes better bolls, which make better food for weevils, and heartier weeds . . . which means more use of pesticides and herbicides to control the situation.

And the race for something to kill mites, which is said to be a $15,000,000 market, is due directly to the pesticides which have killed off the bugs that ate the mites in the past. In the race but still in the testing stage are miticides by such big suppliers as Hercules, Imperial Chemical, Rohm & Haas, Stauffer, Upjohn. On the market are (mostly specialized) miticides by Diamond Alkali, Dow, DuPont, Geigy, Naugatuck, Sherwin-Williams, Stauffer.

It is so easy to draw a moral from slim foundation facts when you wish to. A recent statement says that the fertilizer industry may not be happy about mixing its product with pesticides, but the farmer wants it that way. The figures show that in 1954 US farmers bought 149,100 tons of such mixtures, which was 70% more than the previous year's total. 149,000 tons is not a majority vote in an industry that produces 20 million tons a year! We'll have to wait a bit longer to decide the farmer is forcing us to mix our product with the protective chemicals.

Granulation Cuts Residues

USDA and Iowa AES have been researching the use of insecticides such as DDT, EPN, heptachlor and malathion put up in granular forms. They find them effective, while cutting down the harmful residue problem. On corn borer tests, for example, they did the job but left 100 to 200 times less residue than emulsion sprays.

Tomato Farmers Can Take Root

Florida tomato growers, because of weeds, insects and diseases, have been forced to move frequently to new land every two or three years—turning the problem land into pasture, so that the new crop got the benefit of the plant food put there for the tomatoes. After a few years the land can be used again for tomatoes. Crop chemicals may soon lick this costly method of farming. The University of Florida's Indian River Laboratory is working hard on it.

CONTACTS IN EVERY CORNER OF THE WORLD

Woodward & Dickenson Inc. serves you

with a long reputation for reliability in quality, price and delivery.

POTASH

MURIATE
SULPHATE
NITRATE

NITROGEN

SULPHATE OF AMMONIA
AMMONIUM NITRATE
CALCIUM AMMONIUM NITRATE
UREA

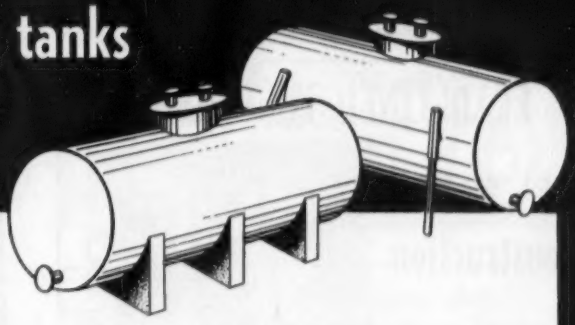
AND ALL OTHER **FERTILIZER** AND **FEED MATERIALS**

ESTABLISHED 1873

Woodward & Dickenson Inc.

1400 SOUTH PENN SQUARE, PHILADELPHIA 2, PA., U.S.A.
TELEPHONE: LOcust 4-5600 Cable Address: "Woodward" TELETYPE: PH109
Branches in MADRID, MANILA, TOKYO, SEOUL, WASHINGTON, D. C., U. S. A.

Delivery in less than 30 days on these low-cost, dual-purpose tanks



Solve liquid fertilizer storage problems quickly, economically and efficiently. A&C rubber-lined tanks are ready for prompt delivery. They assure complete corrosion protection from both phosphoric acid and nitrogen solutions . . . cost far less than any other type of dual-purpose tank. Send coupon for complete information today!

Abrasion & Corrosion Engineering Company

Abrasion and Corrosion Engineering Company
P. O. Box 3568, Amarillo, Texas

Gentlemen:

Without obligation, please send me complete information on low-cost A&C rubber-lined tanks.

Name_____

Company_____

Address_____

City_____ Zone____ State_____

P. O. BOX 3568 AMARILLO, TEXAS

PESTICIDE EXPORTS UP IN FIRST HALF

An 18% increase in the export of pesticides has occurred in the first half of 1955 over the same months of last year, according to the Business and Defense Services Administration.

Current trends indicate that this year's exports may exceed $80 million.

Individual commodities increased in value as follows: BHC, 87 percent; calcium arsenate, 60 percent; DDT—25 percent and over on 100 percent basis—58 percent; lead arsenate, 45 percent; miscellaneous agricultural insecticides and related materials—includes new organic pesticides not separately classified — 37 percent; household and industrial insecticides, 19 percent; and weed killers, 8 percent. On the other hand, exports of sulfur formulations, with 20 percent or more sulfur, dropped 81 percent.

In areas of destination, North Amercia continued to be the largest market valuewise for pesticides, rising 29 percent over the first half of 1954. Specifically, exports to Costa Rica tripled those of January-June 1954, and shipments to Mexico almost doubled.

U. S. exports of pesticides to South America remained about the same; however, shipments to Argentina were over 3 times as great, and those to Uruguay were 13 times as much as in the first half of 1954. Exports to Cuba decreased 26 percent, but shipments to the Caribbean area were up 12 percent compared with January-June 1954 shipments.

Exports to Europe rose 41 percent in the face of increased production of pesticides in that area, with France receiving 3 times and Spain 10 times the amount procured in January-June 1954. As a market for U. S. pesticides, Asia and Oceania was almost 40 percent above the 1954 level. Shipments to India were two and a half times those in January-June 1954, to Iraq and Saudi Arabia three times as much, and to the Philippines twice the 1954 amount.

Exports to Africa were 80 percent higher, and to the Belgian Congo and the Union of South Africa more than twice the amount shipped in January-June 1954. Conversely, shipments to Iran were only half as great, and those to Taiwan were less than a third of those in the first half of the preceding year.

Output of pesticides in January-June 1955, except for lead arsenate and benzene hexachloride, was generally far ahead of the first half of 1954. Production increases in major commodities were as follows: 2, 4, 5-T, 31 percent; calcium arsenate, 28 percent; DDT, 18 percent; copper sulfate, 9 percent—manufacturers' stocks on June 30, 1955, however, were only 40 percent of those on hand a year earlier—2, 4-D, 2 percent. Production of lead arsenate was down 33 percent and output of BHC—100 percent gamma basis—was 32 percent lower.

Less Farm Flying

Agricultural flying in '54 was down about 10% from the previous year. Of the 651,000 hours flown, 40% was for crop spraying, 31% for dusting, 10% for fertilizing.

Good Soil Sterilant

USDA's Forest Service southern experiment station reports good results with 3-(p-chlorophenyl)-1, 1-dimethylurea as a soil sterilant.

Announcement

Official Publication of Association of American Control Officials

Available Dec. 1, 1955 at $2.00 per copy

(Special discount, lots of 100 copies)

Send Orders to

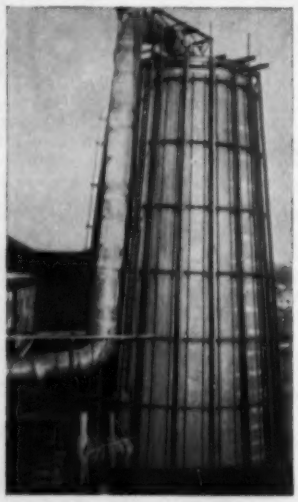
B. D. Cloaninger, Sec'y-Treas.

AAFCO, Drawer 392, Clemson, S. C.

LEAD LINED EQUIPMENT

or

Construction of Complete Acid Plants



Southern Lead Burning Co.

ATLANTA 2, Ga.

P. O. Box 4627 Tel. WAlnut 2576

BERKSHIRE

Specialists in Magnesia for Agriculture

EMJEO (80/82% Magnesium Sulphate)

Calcined Brucite (fertilizer grade) 70% MgO

POTNIT

(95% Nitrate of Potash)

for

Special Mixtures and Soluble Fertilizers

Other Fertilizer Materials

INSECTICIDES — FUNGICIDES

Mercury Compounds for Agricultural Use

DITHIOCARBAMATES

Ferric — Zinc

EXPORT - IMPORT

BERKSHIRE CHEMICALS, INC.

420 Lexington Avenue, New York 17, N. Y.

55 New Montgomery St., San Francisco 5, California

Cable Address — "Berkskem" New York

CLASSIFIED ADVERTISING

For Sale, Exchange and Wanted Advertisements, same type now used, EIGHT CENTS a word for one insertion; TWELVE CENTS a word for two insertions; FIFTEEN CENTS a word for three insertions, and FOUR CENTS a word for each insertion more than three; ADVERTISEMENTS FOR THIS COLUMN MUST BE PAID IN ADVANCE.

BONDED EQUIPMENT BARGAINS: New Conveyor Belting; 4-ply, 28 oz. duck, 1/8" x 1/32" rubber covers. 18", $3.19 foot; 24", $4.14 foot; 30", $5.06 foot, Other widths and plies available at bargain prices. 5" roll diameter Troughing Idlers and Return Rolls. Any width. Priced from $6.75. Vibrating Screens; sizes 2' x 4' to 5' x 14'; 1 to 5 decks. For any screening operation. Priced from $355.00. Large stocks of Screen Cloth. Immediate shipment from our factory. Write for new Catalogs # 1086 and 1087 describing Screens, Catalog # 1119 describing Crushers, List # 1124 of New and Used Equipment. Bonded Scale Company, 111 Kingston, Columbus, Ohio. Phone HI 4-2186.

FOR SALE: Rotary Dryers 5' x 30', 5' x 40', 4'6" x 50', 5' x 67', 6' x 60', 9' x 80'. (1) Pressure Tank 13,000 gal. 220#. Also Mixers, Storage Tanks, Screens, Elevators. Send us your inquiries. Brill Equipment Company, 2402 Third Ave., New York 51, N. Y.

POSITION DESIRED—Experience all phases of fertilizer business, production, management, purchasing, sales. Age 40 years. Now located in mid East. Box # 40, c/o Commercial Fertilizer, 75 3rd St., N.W. Atlanta, Georgia.

WANTED: Job as Plant Superintendent. More than 25 years experience. Am now employed but have good reason for desiring change. Write Box 34, c/o Commercial Fertilizer, 75—3rd St., N. W., Atlanta, Ga.

FOR SALE: (4) Rotary Kilns and Dryers: 10'6"D x 105', 5' x 30', 4'6" x 40', 3' x 25'. (3) 23,400 gal. Horiz. Welded Steel Tanks. (2) 14,100 gal. Horiz. Welded Glass Lined Steel Tanks. (4) 15,000 gal. Vertical Welded Steel Tanks with coils. (12) 3,000 gal. Horiz. Aluminum Tanks. Also Pulverizers, Mixers and Conveying Equipment. Perry Equipment Corp., 1426 N. 6th St., Philadelphia 22, Pa.

LAW & COMPANY
Founded 1903
FERTILIZER CHEMISTS
Three Convenient Laboratories
P. O. Box 1558 Atlanta, (1) Ga.
P. O. Box 789 Montgomery, Ala.
P. O. Box 629 Wilmington, N. C.

Serving the
FERTILIZER INDUSTRY
Fertilizer Equipment Sales Corp.
Designers — Engineers — Manufacturers of Fertilizer Machinery
Sales and engineering office:
P. O. Box 1968
130 Krog St., N. E.
Atlanta, Ga.
Phone Cypress 6615
Manufacturing plant:
P. O. Box 67
1610 Kentucky St.
New Orleans, La.
Phone Bywater 8373

VERMICULITE FINES
(Fertilizer Conditioner)
Truck and Carload Quantities
American Vermiculite Company, Inc.
Phones 2201 & 2301
Roan Mountain, Tennessee

Cut Production Costs—
Speed up your plant with
ATLANTA UTILITY
FERTILIZER MACHINERY
Fertilizer Mixing Systems
Revolving Screens
Mixing Plows
Clod Breakers
Elevators
Fertilizer Shakers
Cage Mills
Batch Mixers
Write Today for Descriptive Folder
ATLANTA UTILITY WORKS
EAST POINT, GA.

Wiley & Company, Inc.
Analytical and Consulting Chemists
Calvert & Read Streets
BALTIMORE 2, MD.

SHUEY & COMPANY, INC.
Specialty: Analysis of Fertilizer Materials and Phosphate Rock. Official Chemists for Florida Hard Rock Phosphate Export Association. Official Weigher and Sampler for the National Cottonseed Products Association at Savannah; also Official Chemist for National Cottonseed Products Association.
115 E. Bay Street, Savannah, Ga.

SOUTHERN STATES PHOSPHATE and FERTILIZER CO.
SAVANNAH, GEORGIA
Manufacturers of SULPHURIC ACID, SUPERPHOSPHATE, COMPLETE FERTILIZERS
and ALL TYPES OF BASE GOODS
EXPORT ORDERS SOLICITED

THE DOWD PRESS, INC., CHARLOTTE, N. C.

F-SERIES
BULK CONVEYORS
HERE ARE BULK CONVEYORS UNEXCELLED BY NO OTHER LINE ON THE MARKET. CONSTRUCTED OF THE BEST MATERIALS. ENGINEERED FOR TROUBLE FREE OPERATION. DESIGNED TO BE EASILY MOVEABLE AND HANDY TO USE. IF YOU HAVE A BULK HANDLING PROBLEM ONE OF THESE CONVEYORS CAN DO MUCH TO SOLVE IT.
E L X O N
PRODUCT OF THE CHANTLAND MFG. CO.
MADE IN SIZES FROM 10 TO 36 FEET

Lancaster, Allwine & Rommel
Registered Patent Attorneys
Suite 428
815—15th STREET, N. W.
Washington 5, D. C.

Patent Practice before U. S. Patent Office. Validity and Infringement Investigations and Opinions.

Booklet and form "Evidence of Conception" forwarded upon request.

Alex. M. McIver & Son

BROKERS

Specializing

SULPHURIC ACID

Ground Cotton Bur Ash, 38/42% K_2O Potash.

Nitrogenous Materials

Castor Pomace

Urea, 45½% and 46% Nitrogen

DI-N-CAL—20.5% Nitrogen
(Calcium Ammonium Nitrate)

Representatives

Morgan Brothers Bag Company, Inc.

Bags—Paper and Textile

Ammoniated Base and Superphosphate

Dolomitic Lime
(42-44% Magnesium Carbonate)
54-56% Calcium Carbonate)

POTASH

PEOPLES OFFICE BUILDING
Charleston South Carolina
Phones: 3-4828 and 3-4829

INDEX TO ADVERTISERS

Abrasion and Corrosion Engineering Co. 67
Agricultural Extension Section, United States Steel Corp. .....
Albemarle Paper Manufacturing Company 13
Allied Chemical & Dye Corporation (Nitrogen Div.) ..... Front Cover
American Agricultural Chemical Company, The ..... Inside Front Cover
American Limestone Co. .....
American Potash & Chemical Corporation 8
American Vermiculite Co. 69
Arkell Safety Bag Company 25
Arkell and Smiths 29
Armour Fertilizer Works 6
Ashcraft-Wilkinson Co. ..... Back Cover, 61
Atlanta Utility Works 69

Bemis Bro. Bag Co. 15
Berkshire Chemicals, Inc. 68
Blaw-Knox (Equipment Division) 57
Blue Valley Equip. Mfg. & Engr. Co. .....
Bradley & Baker (U. S. Phosphoric Products) 45

Chantland Mfg. Company 70
Chase Bag Company .....
Chicago Fertilizer Co. 64
Cole Manufacturing Co., R. D. .....
Commercial Solvents Corporation 54

Davidson-Kennedy Co. 41
Deere & Co. (Grand River Chemical Div.) 51
Duval Sulphur and Potash Co. 21

Escambia Bay Chemical Corp. 61
Evans Metal Company 64
Exact Weight Scale Company, Inc. 58

Fertilizer Equipment Sales Corp. 69
Flint Steel Corp. .....
Fulton Bag & Cotton Mills 59

General American Transportation Corporation 52
Grace Chemical Company .....
Grand River Chemical Division, Deere & Co. 51

Hammond Bag & Paper Company 20
Harte Company, John J. 5
Hough Co., The Frank G. .....
Hudson Pulp & Paper Corp. 7

International Minerals & Chemical Corporation
Phosphate Chemicals Division 43
Phosphate Minerals Division 18
Potash Division .....

Johnson Company, C. S. 37

Koppers Company, Inc. (Tar Products Div.) .....
Kraft Bag Corporation .....

Lancaster, Allwine & Rommel 70
Law & Company 69
Link-Belt Company .....
Lion Oil Company, A Division of Monsanto Chemical Co. 3

McIver & Son, Alex M. 64, 70

National Lime and Stone Co., The .....
New York Hanseatic Corporation 36
Nitroform Agricultural Chemicals Division
Woonsocket Color & Chemical Co. 27
Nitrogen Division (Allied Chemical & Dye Corp.) .....

Phelps Dodge Refining Corp. .....
Phillips Chemical Company .....
Potash Company of America ..... Inside Back Cover

Quaker Oats Company, The (Chemicals Dept.) 64

Raymond Bag Company, The 32
Renneburg & Sons Co., Edw. 55

Sackett and Sons Co., The A. J. 38, 39
St. Regis Paper Company, Multiwall Bag Division 16, 17
Shuey & Company, Inc. 69
Simplicity Engineering Company 12
Smith-Rowland Company .....
Sohio Chemical Co. 49
Southern Lead Burning Co. 68
Southern States Phosphate and Fertilizer Co. 69
Southern Steel Equip. Co. 64
Spencer Chemical Company 47
Stedman Foundry & Machine Company, Inc. 10
Sturtevant Mill Company 9

Tennessee Corporation 10, 45
Texas Gulf Sulphur Co. 63
Tull Metal & Supply Co., Inc., J. M. .....

Union Bag & Paper Corporation .....
Union Special Machine Co. .....
U. S. Phosphoric Products Division, Tennessee Corp. 45
United States Potash Company, Inc. 11
United States Steel Corp. (Coal Chemical Sales Div.) 30, 31

Virginia-Carolina Chemical Corporation .....

Weatherly Company, The D. M. 14
Wiley & Company, Inc. 69
Willingham-Little Stone Company .....
Woodward & Dickerson, Inc. 67

Sincere best wishes for a happy Holiday Season.

P.C.A.
The SALT of the EARTH
RED MURIATE

POTASH COMPANY OF AMERICA
CARLSBAD, NEW MEXICO.

General Sales Office . . . 1625 Eye Street, N.W., Washington, D.C.
Midwestern Sales Office . . . First National Bank Bldg., Peoria, Ill.
Southern Sales Office . . . Candler Building, Atlanta, Ga.

FERTILIZER MATERIALS

FOREIGN AND DOMESTIC

- NITROGEN COMPOUNDS
- SULPHUR & POTASH
- ORGANIC AMMONIATES
- INSECTICIDAL AND INDUSTRIAL CHEMICALS

VEGETABLE OIL MEALS & FEEDSTUFFS

EXCLUSIVE DISTRIBUTORS.
DUVAL SULPHUR AND POTASH COMPANY
ESCAMBIA BAY CHEMICAL CORPORATION

ASHCRAFT-WILKINSON CO.

Home Office
ATLANTA, GEORGIA

Cable Address
ASHCRAFT

Norfolk, Va.
Charleston, S. C.

Tampa, Fla.

Jackson, Miss.
Columbus, Ohio